A comparison of the effectiveness of video modelling and point-of-view video modelling on the social skills of primary school children with autism.

Angela Jeannine Guta
Doctor of Philosophy
School of Education, Communication and Language Sciences
Newcastle University
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Abstract

The number of children diagnosed with autism continues to grow at a startling rate. Meeting the needs of individuals with autism is not just a concern for parents, healthcare professionals, and educators. It is equally a concern for society at large. Individuals with autism face difficulties with their social skills. In dealing with such difficulties, evidence-based interventions, such as video modelling, have allowed researchers to make some progress in terms of changing the trajectory of the deficit of social skills in children with autism. Further, video modelling can be considered a cost-effective and time efficient form of intervention which can readily be used in the home, classroom and community. The aim of this study was to compare video modelling and point-of-view video modelling in order to see which approach was more effective on the social skills of primary children with autism in the UK, specifically concerning their verbal and action imitation skills. In the present study, a mixed-methods approach was used involving a single-subject, multiple-baseline design across three groups of participants and three treatment conditions—video modelling from the third-person perspective, point-of-view video modelling from the first-person perspective and a control group. The research design included baseline, intervention and follow-up probes using three play sets. All sessions were videotaped and transcribed for data analysis. Data from descriptive narrative records was analysed using event recording. Results suggest that point-of-view video modelling was more effective than video modelling in increasing the verbal and action imitation skills for two out of the three groups of participants in this study. However, this study has its own limitations given the small sampling size and similar other factors. In light of this, the results will be discussed in relation to existing research. Finally, recommendations for future research and practice, policy and theory will be suggested.

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Dedication

This thesis is dedicated to my husband Mihretu and our son Pete for their never ending love, support and encouragement; my parents Paul and Carol Landrey for being my very first role models to aspire to; and my brother Rich, whom I miss so very much.

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Chapter 1. Introduction

"Learning would be exceedingly laborious, not to mention hazardous, if people had to rely solely on the effects of their own actions to inform them what to do. Fortunately, most human behaviour is learned observationally through modelling: from observing others one forms an idea of how new behaviours are performed, and on later occasions this coded information serves as a guide for action."

Albert Bandura, **Social Learning Theory**, 1977, p.22

1.1 Introduction

This research study is a journey to understand how video modelling can affect the social skills of primary children with autism in the UK, specifically their imitation skills. One may ask, 'why is this an area of concern?'

Just imagine yourself as a parent of a child who is not interested in the comings and goings of his parents but is extremely sensitive to small changes in his environment. Imagine a child at a birthday party with his ears covered and off to himself rocking. Imagine a child at school playing alone, spinning the wheels of a toy car, while not acknowledging his friends around him.

Further, imagine *yourself* being a child who upon entering a classroom, is overwhelmed by all the stimuli in the room, from the displays on the walls, to the displays hanging from the ceiling. You are encouraged to go to the dramatic play area which is filled to the brim with children playing with various toys from the play kitchen area, to the dress up area, to an area with play-doh and modelling clay. In another area, children are on the carpet area playing with toys cars and trains. You hear squeals of delight, laughter, chitter-chatter, and the hum of the air conditioning unit overhead. All of these noises are competing for your attention. To top it off, you notice the flicker of the fluorescent lights overhead which goes off every thirty seconds or so. As you hear and see all of this stimuli at once, you begin to shut down. You drop to the floor, begin to rock back and forth and begin to find a way to tune out the overwhelming overload of sensations.

What are we talking about in these examples? Autism.

Autism is a neurodevelopmental disorder characterized by deficits in social communication and social interaction, and restricted, repetitive patterns of behaviour, interests, or activities. (American Psychiatric Association, 2013). The deficit in social relatedness is considered the *most pervasive* and *troubling*. It is considered the **'core feature'** of the general syndrome (Carter et al., 2005; Sigman, 1994; and Rogers, 2000).

What would a social skills deficit look like in a child with autism? At a very early age the child may show a lack of seeking enjoyment or interest in others (American Psychiatric Association, 2000, 2013; Carpenter and Tomasello, 2000). The child may not bring a toy of interest to another person. The child may have difficulty with joint attention (i.e. sharing an interest in a toy through eye gaze and gestures with another person) (Carpenter and Tomasello, 2000). Children with autism also demonstrate an inability to maintain social interactions.

Why is this research so important? Before answering this question, let us first take a look at the prevalence of autism, the historical background of autism, and the diagnostic criteria for autism spectrum disorders.

1.1.1 Prevalence of autism

Currently in the United States (US) alone, 1 in 68 are affected with autism. These numbers are based on the current statistics available at the Centers for Disease Control and Prevention (n.d.). This amounts to over 2 million people in the US affected with autism. In the United Kingdom (UK), it is estimated that 1 in 100 are affected with autism. These figures are based on the current statistics available at the National Autistic Society (n.d.). This accounts for 700,000 people affected with autism in the UK.

1.1.2 Historical Background of Autism

Autism was first described in 1943 by Dr. Leo Kanner, a child psychiatrist. In his clinical account, Kanner described features of autism in a group of children which are resonated in the current diagnostic manuals. Around the same time, Hans Asperger, a paediatrician, described a group of children with a milder form of autism, known as Asperger Syndrome (Interactive Autism Network, n.d.; Plimley and Bowen, 2007). The work of Kanner and Asperger continues to be recognized today.

Inclusive in its name, Autism Spectrum Disorders, is the word 'spectrum'. This word, as it suggests, explains how individuals with autism may have challenges that range from mild to severe. There can be differences in ability level (i.e. strengths) as well as disability (i.e. weaknesses). On the mild end of the spectrum, some people with autism may have what would be considered a very rich vocabulary. While on the severe end of the spectrum, some people with autism may not have any functional speech. Similarly, in regards to social skills, on the mild end of the spectrum, some people with autism might be 'socially active', while on the severe end of the spectrum some people may be socially withdrawn. It should be pointed out that although some individuals with autism may appear to be 'socially active', they may still be perceived as oblivious or peculiar in their mannerisms (Interactive Autism Network, n.d.).

1.1.3 Diagnostic Criteria

The recognized descriptors for diagnosing autism are found in the *Diagnostic and Statistical Manual of Mental Disorders (DSM),* which is compiled by the American Psychiatric Association, and the *International Classification of Diseases, Diagnostic Criteria for Research (ICD),* which is compiled by the World Health Organisation. The diagnostic criteria for Autism Spectrum Disorder has recently been revised in the *DSM*. Most recently, autism has been linked to a triad of impairments. In this regard, the *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-4)* categorized autism as an impairment in social interaction, communication, and a restricted repertoire of activities and interests (American Psychiatric Association, 1994). The triad of impairments has now been changed to two main areas: (1) Persistent deficits in social communication and social interaction, and (2) Restricted, repetitive patterns of behaviour, interests, or activities. (American Psychiatric Association, 2013). (See Appendix A for the complete diagnostic criteria from the new *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)).*

In the United Kingdom (UK) where this research took place, diagnoses of autism are made based on the *International Classification of Diseases, Diagnostic Criteria for Research (10th Edition) (ICD-10)* (1992), published by the World Health Organisation. The *ICD-10* still reflects the triad of impairments: (1) Qualitative impairment in social interaction, (2) Qualitative abnormalities in communication, and (3) Restricted, repetitive, and stereotyped patterns of behaviour, interests, and activities. The next version of the ICD-10 is due to be published in 2015. (See Appendix B for the complete diagnostic

criteria from the *International classification of diseases: Diagnostic criteria for research* (10th edition)).

Although the diagnostic criteria for autism has changed in the DSM-5, it is still commonly thought of as a disability that is characterized by deficits in social interaction, communication and rigidity of behaviour and thought. The research identified in this study's literature review (chapter 2) still reflects the previously recognized diagnostic criteria of autism—the triad of impairments. In light of this, references may still be made to three areas of impairment, which have now been collapsed into the two core areas (i.e. social communication/interaction and restricted, repetitive patterns of behaviour, interests, or activities) (American Psychiatric Association, 2013).

Having looked at the prevalence of autism, the historical background of autism, and the diagnostic criteria, let us now turn to the core features of autism. Specifically, we will uncover the impact of the social skills deficit of children with autism on their overall development.

1.1.4 Core features of autism

The first core area of deficits in autism (as indicated in §1.13), has to do with social communication and social interaction. This study will focus primarily on these deficits, which will be discussed at length in §1.2.1 and 1.2.2 where I will look at social skills and play skills in detail. However, the second core area of restricted, repetitive patterns of behaviour, interests and activities is not the primary focus of this study. Yet still, it is important to take a brief look at how the restricted, repetitive patterns of behaviour of individuals with autism impacts their social skills. Children with autism often appear to show little or no interest in pretend play (Schuler and Wolfberg in Wetherby and Prizant, 2000, Bupa, n.d.). Instead they may appear to be more interested in their own pattern of repetitive activities and behaviour. Some describe this situation as rigid and limited play patterns (Brereton and Tonge, 2002). Some children with autism may develop play that appears to be creative on the surface level such as re-enacting the school day with a doll or acting out a favourite scene from a video. However, as Brereton and Tonge (2002) point out, if we look more closely at this type of play, it is often highly repetitive and does not change, nor can it be interrupted (p. 10).

Rigidity of behaviour and thought can include stereotypical play behaviour, such as lining up cars based on their colour or size; extreme physical rituals such as spinning or rocking; and a complex order of play or an activity such as following a particular routine in play every time that toy is played with (Plimley and Bowen, 2007). Children with autism can also show an intense attachment to special objects that they either play with or collect. When any of these objects are either taken away or their patterns are disrupted, a child can show great distress or upset (Brereton and Tonge, 2002). This upset continues until the objects are placed back into the same pattern or to their original state. Rigid and repetitive behaviours in individuals with autism also lead to difficulties with executive function (i.e. the ability to plan, control impulses or regulate oneself, inhibit behaviours and show mental flexibility) (Pennington and Ozonoff, 1996). The restrictive patterns of play and interests of children with autism can also contribute to their social isolation (Wolfberg and Schuler, 1993). That said for now, it is important to keep in mind that the repetitive and ritualistic behaviours of children with autism impact their social skills development and how they may be perceived by their peers. This area will be discussed within the context of social skills and play skills.

Of the three formerly recognized areas of impairments, many argue that social deficits can be considered a 'core feature' of the more general syndrome (Carter et al., 2005; Rogers, 2000; Sigman, 1994). Wing (1988), in referring to the triad of impairments, suggests that each area of impairment will have a marked impact on all areas of social skills throughout the lifespan. Similarly, Ozonoff and Miller (1995) stress the importance of the development and improvement of social skills for overall long term adjustment. As children with autism improve in the area of social skills, they will be better equipped to adjust to all other aspects of life. Once again, this illustrates the importance of interventions in addressing the core deficit of social skills in individuals with autism.

In the context of free play, or unstructured play, children with autism typically avoid the social advances of their peers. They often do this by entering into play passively or without self-initiation, or approaching peers in an awkward manner (Lord, 1984; Wing and Attwood, 1987; Wolfberg, 1999). This can be seen as an apparent lack of desire to socialize with others (Plimley and Bowen, 2007). If children with autism do not develop interpersonal skills and flexibility in the context of play, they will have great difficulty forming friendships or developing social relations (Wolfberg and Schular, 1993). In this

regard, Schular and Wolfberg (1993) suggest that if the social exclusion of children with autism is not addressed, the social deficit will increase to a greater degree.

But what is the cause of social deficit in individuals with autism? In this regard, different theories exist as to the underlying cause of social deficits in individuals with autism. These include: theory of mind, mind-blindness, weak central coherence hypothesis and the executive dysfunction hypothesis. Although it is not the focus of this research, I will briefly describe some of these theories. According to theorists, the social and communicative behaviour that some individuals with autism exhibit results from their failure to acquire a *theory of mind* (Repacholi and Slaughter, 2003). This theory attempts to show how individuals with autism have difficulty understanding the mental state of another person (i.e. understanding another person's beliefs, desires or needs) (see Baron-Cohen, 1997; Baron-Cohen et al., 2000; Baron-Cohen, Leslie, and Frith, 1985; Baron-Cohen, Tager-Flusberg and Cohen, 1993). Another theory, the *Weak Central Coherence Hypothesis*, suggests that individuals with autism process information in a disconnected way i.e., focusing on certain details, while missing out on the big picture (see Frith, 1989 and Happe and Frith, 1996). The *Executive Dysfunction Hypothesis* draws a direct link between executive function impairments and deficits in theory of mind (Pennington and Ozonoff, 1996). Executive function includes the ability to evaluate one's own behaviour and make changes as needed (Damasio, 2001). This includes both working memory and cognitive flexibility. Executive function involves the ability to generalize previous experiences to novel situations, which plays an important role in perspective taking (Semrud-Clikeman, 2007). Having relationships with others allows children to develop the skill of generalizing previous experiences to new ones. Difficulties with thinking and behaving flexibly in order to understand another person's beliefs and thoughts can be attributed to difficulties in both theory of mind and executive function (Semrud-Clikeman, 2007). Problems with executive function (Executive Dysfunction Hypothesis) are linked to problems with language and social reciprocity as well as rigid and repetitive behaviours in individuals with autism (Pennington and Ozonoff, 1996). Although this list is not exhaustive, it sheds light on the current theories that deal with the root causes of the social impairment for individuals with autism.

Having briefly laid the foundation for understanding the core features of autism, I now take an in-depth look at the social skills deficit. This will include a discussion about the role of imitation skills and play skills in social skill development, followed by a

discussion about social skills throughout the school years. Finally I will discuss how all of these skills can come together for the development of social competence.

1.2 Social skills

Social skills is an overarching term that includes verbal and nonverbal communication skills, emotional regulation, flexibility, problem solving, perspective taking, and interpersonal skills. It includes the communication skills of initiating a conversation, joining in on a conversation, verbal turn-taking, and listening skills. It also includes imitation skills such as toy/object imitation, motor imitation, verbal imitation, and gesture imitation. Social skills encompass play skills such as initiating play, joining in on existing play, turn-taking, sharing, reciprocal play, imaginative play, and cooperative play. It is through the development and mastery of social skills that a person is deemed as socially competent (For further information, see Baron-Cohen, 1995; Carpenter, in Rogers and Williams, 2006; Carpenter and Tomasello, 2000; Crick and Dodge, 1994; Dodge et al., 1983; Hogan, n.d.; Rogers and Bennetto, 2000; Ingersoll, 2008; Rogers and Pennington, 1991; Plimley and Bowen, 2007; Semrud-Clikeman, 2007; Wetherby and Prizant, 2005 Uzgiris, 1981).

In the sections to follow, I will describe the social skills of imitation and play skills followed by an in-depth look at social skills and autism throughout the school years. Finally, I will address how the deficits in social skills impacts the social competence of individuals with autism.

*1.2.1 **Imitation skills and autism***

Imitation can be considered as a subset of social skills, social relatedness and joint attention skills (Baron-Cohen, 1995; Wetherby and Prizant, 2005, Hogan, n.d.). Imitation skills can include toy/object imitation, motor imitation, verbal imitation, and the imitation of gestures. This study specifically looks at verbal and action imitation skills within a play sequence. In regards to object imitation, Hogan (n.d.) suggests that children first learn to imitate simple actions using objects before they move on to imitation of body movements. Object imitation first involves actions that are intended for that object (e.g. pushing a car across the table), followed by actions that the object is not intended for (e.g. rolling a drum stick across the table rather than hitting it on a drum). In addition to following object imitation, children also imitate body movements. Hogen claims that this is a more difficult skill, since it requires the child to remember what he/she observes and then make that action. Granpeesheh (2014) describes non-vocal imitation skills as part of

a critical foundation for the development of more advanced social skills (p. 290). Moreover, Granpeesheh notes that imitation skills are among the first skills to emerge in child development. Through non-vocal imitation, an individual can observe and copy the behaviours of others. In doing so, he/she can learn ways to engage with his/her surroundings (p. 290).

Whether imitating language or actions, the learner must determine "what" it is that he/she is attempting to imitate. In this regard, Carpenter, in Rogers and Williams (2006), pointed out several important factors to be considered when deciding what to imitate. They include the goals and intentions of the communicator/model, the goals and intentions towards the object, communicative intentions, and shared knowledge. Similarly, Rogers and Bennetto (2000) describe the various components involved in imitation. They include visually perceiving the movement, encoding the movement into working memory, mapping the change from a visual stimulus to a proprioceptive stimulus in one's body, creating a movement plan, performing it, and compare their movement to what was originally perceived.

Imitation skills play an important role in language development, play skills and joint attention (Carpenter and Tomasello, 2000; Rogers and Pennington, 1991). In typical infant development, imitation serves two functions—a learning function and a social function (Uzgiris, 1981). Through imitation, infants gain new skills and knowledge (i.e. learning function). Through imitation, they participate in social and emotional interactions with others (i.e. social function). For example, infants participate in interactions with caregivers where they engage in mutual and reciprocal imitation of vocalizations and facial expressions (Ingersoll, 2008). These reciprocal, give-and-take imitation interactions play an important role in the development of future early peer interactions (Ingersoll, 2008). Further expanding on this idea, Carpenter (2006) emphasized that either the learning function ('instrumental function' as Carpenter refers to it) or the social function can be important to the learner at the moment of demonstration. In light of this, the component that is more interesting to the learner—instrumental or social—is more likely to be imitated.

As we already discussed, it is suggested that individuals with autism process information in a disconnected way. As a result, individuals with autism focus on certain details, while missing out on the big picture (see Frith, 1989 and Happe and Frith, 1996). For instance,

when we look at imitation skills, individuals with autism may focus on erroneous details in what is being modelled, as opposed to focusing on the relevant details that should be imitated. In a study conducted by Ohta (1987), children with autism copied an action according to their own perspective. That is, when shown a palm facing towards them, children with autism held their hand so that it faced them, rather than turning it to face away from them. This demonstrates the difficulty in understanding the perspective of the model giving the demonstration. (For similar studies involving reproducing actions from one's own perspective, see Hobson and Lee, 1999; Meyer and Hobson, 2004; Smith and Bryson; 1998; Whiten and Brown, 1998).

The same thing has been seen in a study conducted by Shield and Meier (2012) in which children with autism, who had native exposure to a sign language such as American Sign Language (ASL), demonstrated a reverse palm orientation on signs that are intended to be either inward or outward in orientation. The reverse palm orientation supports the notion that individuals with autism imitate gestures as they appear from their own perspective. Reversal errors for children with autism can occur not only in their imitation of actions but in their speech as well. For example, individuals with autism often demonstrate pronoun reversals. This can be seen when a child says "you" rather than "I" or "me". For instance, a child might say, "You want milk" instead of "I want milk". The difficulty of perspective taking in individuals with autism has been well documented in the literature. Perspective taking is an important skill in demonstrating social competence. This is a major area of deficit for individuals with autism.

For an extensive look at imitation in relation to autism and typical development, see Rogers and Williams, 2006. Also see Rogers and Bennetto, 2000; Charman et al., 1997; Dawson, Meltzoff, Osterling, and Rinaldi, 1998; Loveland et al., 1994; Rogers, Bennetto, McEvoy, and Pennington, 1996; Smith and Bryson, 1998, Stone and Hogan, 1993; Stone and Lemack, 1991.

1.2.2 Play skills and autism

Children learn about the world around them through play. Initially children start off in solitary play. As a child develops, he moves from solitary play to more advanced forms of play (character play, parallel play, associative play and cooperative play). As children begin to expand their play by including other children and adults in their play, they begin to develop their social skills.

One of the major symptoms that characterize individuals with autism is their inability and lack of interest to become involved in play activities (Demetrius Haracopos as cited by Beyer and Gammeltoft, 1998, p. 9). Haracopos further states that when children with autism play with toys, it is often non-goal directed and is often unusual (Beyer and Gammeltoft, 1998, p. 9). Children with autism usually exhibit a lack of interest in playing with other children. They often prefer individual activities (Plimley and Bowen, 2007). They may also appear to be aloof and often demonstrate a lack of empathy (Plimley and Bowen, 2007). They do not play in a varied and spontaneous way (Beyer and Gammeltoft, 1998, p. 17). In fact, it is common to find a child with autism spending hours on the same activity (which can be a monotonous or repetitive activity). This further impacts the ability for others to engage children with autism in activities which are deemed meaningful (Haracopos, p. 9).

A child who is perceived to be sociable is one who prefers the presence and interaction of others rather than being alone (Semrud-Clikeman, 2007). It is more difficult for a child with autism, who prefers to play alone, or appears to be in his own world, to be considered sociable. So, responsivity is another important social skill. For example, this happens when the infant or child responds to another person. If the child does not respond to others, this may affect how often the child is approached by others (Semrud-Clikeman, 2007). When child with autism is challenged with overarousel or underarousel, this complicates how he responds to others, which impacts his/her responsivity. The difficulties that individuals with autism face with processing sensory input (sensations and movement) can affect their ability to communicate and relate to others (Barron and Barron, 1992; Rubin et al., 2001; Strandt-Conry, 1999). For example, they have difficulty initiating and following through with movements. They may also have difficulty sequencing the steps involved in speech, thought and emotion, such as stopping, combining and switching sensations (Hill & Leary, 1993; Donnellan, Leary & Robledo, 2006). Additionally, individuals with autism often lack the sensation of feedback from their own bodies. This poses the challenge of not always being aware of one's own facial expression, position in space and movements (Blackman, 1999; Hale & Hale, 1999; Williams, 1996a, 1996b, 2003). For others, heightened sensitivity to sounds and sights can cause them to become painful and intense (Condon, 1985; Williams, 1992 & 1996b).

So, engaging in play promotes the development of social, communicative and linguistic competence (Bretherton, 1984; Bruner, 1986; Corsaro and Schwarz, 1991). Through play,

children learn to initiate, interpret the play of others and respond to the social cues of others (Dodge, Schlundt, Schocken, Delugach, 1983). Children learn how to negotiate and to compromise during play (Dunn, 1991; Garvey, 1977). For example, Vygotsky (1933/1966, 1978) considers play a primary social activity for interpersonal skills, social knowledge and symbolic capacities. The development of symbolic play and peer interaction in individuals with autism is directly challenged by their impairments in reciprocal social interaction, communication and imagination (Schuler and Wolfberg in Wetherby and Prizant, 2000).

Although individuals with autism make gains in their communication skills, they often do not use their verbal skills to relate to peers and/or to engage in pretend play. They typically use their speech to make concrete requests or protests rather than to comment, describe or share within their play (Schuler and Wolfberg in Wetherby and Prizant, 2000, p. 251). They use words and phrases in unusual or peculiar ways (Plimley and Bowen, 2007). They also find challenging a literal understanding of words and phrases (Plimley and Bowen, 2007). Individuals with autism often interpret social situations literally, which results with an incorrect interpretation of the social situation (Semrud-Clikeman, 2007). The challenges with interpreting communication and social situations literally can be difficult within the changing themes of play. Concerning this, Schuler and Wolfberg suggest that participating in peer play, specifically the negotiation of varied themes in play, can be the cure for the behavioural rigidity often seen in individuals with ASD (Schuler and Wolfberg in Wetherby and Prizant, 2000, p. 252).

Moreover, Schuler and Wolfberg (Ibid.) point out that without specific interventions targeting play skills, children with autism tend to stick to repetitive play. This can be seen in how they manipulate objects or how they repeat identical acts within their play. That means that they are unlikely to exhibit functionally appropriate play skills. If one were to look more closely at the pretend play of children with autism, one would find that their play is highly repetitive. However, this is in sharp contrast to the play of typically developing children which are filled with rich and thematic variations in their play. Schuler and Wolfberg also point out that typically developing children demonstrate restrictive play patterns which are later broadened as they learn to negotiate both verbally and nonverbally through negotiations in their play (p. 253). A number of other studies have also shown that children with autism are able to participate in more complex and

varied play with the support of experienced peers (Goldstein and Cisar, 1992; Wolfberg, 1995, 1999; Wolfberg and Schuler, 1993).

1.2.3 Social skills and autism throughout the school years

That said, here it is important to take a look at how the impairment in social interaction presents challenges throughout the school years and well into adulthood. In early infanthood, children with autism may show a lack of recognition of family members or display a lack of wanting the attention of others while playing (e.g. not holding up a toy for approval) (Plimley and Bowen, 2007). The child's language may slow down or even stop. Some children with autism do not respond to his/her name. When this happens, the child may come across as 'deaf'. The child may play alone but often in a repetitive manner (i.e. lining up toy cars in the same pattern during each time of play). The child may also not point out an item of interest or make an effort to gain another person's attention (Baron-Cohen, 1989). In contrast, in early infanthood, a typically developing child quickly learns behaviours to gain the attention of others, such as pointing, crying, vocalizing or intentionally dropping an object (Plimley and Bowen, 2007). But whereas the child with autism may appear to be passive and lacks the motivation to demonstrate attention seeking behaviours.

From the time children enter preschool, there is a pressure to join in and conform to others. For example, a preschooler needs to learn how to play with others, handle conflicts, assert oneself, share toys, and regulate his own emotions (Semrud-Clikeman, 2007). In this case, the preschool environment can be highly stimulating, which some children with autism may find over stimulating (Plimley and Bowen, 2007). Keep in mind that children with autism may display an adverse response to specific stimuli (i.e. visual, auditory) (American Psychiatric Association, 2013). When they do so, typically developing peers can find it difficult to understand. For instance, as Plimley and Bowen (2007) point out, as the child with autism matures, their social differences become more obvious. That is, when children are older, there is an expectation that their behaviour matches their chronological age. This is not always the case with children with autism. For example, children with autism may demonstrate a lack of curiosity in others. They also display their inability to move their focus from an activity of interest in order to join in with peers (Plimley and Bowen, 2007).

As children progress through school, peers become very important for socialization (Semrud-Clikeman, 2007). This is because basic social skills such as turn-taking, listening to the other speaker and showing non-verbally that one comprehends the conversation, have all been linked to peer acceptance (Semrud-Clikeman, 2007). Children are expected to share their opinions as well as to listen to the opinions of their classmates. But doing this can be problematic for children with autism. This is because children with autism sometimes like to control the conversation by sharing information that is highly interesting to them, although which may not be to the audience (Plimley and Bowen, 2007). Moreover, children with autism find it difficult to know when to enter into a conversation and when to allow pauses for someone else to enter into the conversation (American Psychiatric Association, 2013; Grandin and Scariano, 1986). At this stage, skills for negotiating, conflict resolution and compromising are all deemed important (Semrud-Clikeman, 2007). Each of these skills involve perspective taking and an understanding of the emotions of others, which involves theory of mind. The difficulty children with autism have in adjusting their behaviour to suit various social contexts, therefore, impacts their ability to flexibly adapt to the changing social world of school (American Psychiatric Association, 2013).

In any social situation, a great deal of information is available at one time. But what determines what one chooses to pay attention to? As we saw earlier with the Weak Central Coherence Hypothesis, individuals with autism may focus on certain aspects of a situation, while missing out on the big picture (Frith, 1989; Happe and Frith, 1996). As Sigman et al. (1992) noted, children with autism often focus on the event and objects involved in a social situation, rather than on the people. Further, Klin et al. (2002) found that people with autism can become distracted with irrelevant items, such as objects, and ignore the more essential aspects of the interaction such as facial and body gestures of people.

So far our focus has been on pre-teen years of children with autism. But what does the situation look like at the teenage years? For teenagers with autism, transitions from one classroom to the next or one grade level to the next can be highly problematic. Since individuals with autism have difficulty with changes in routine and a desire for predictability, they demonstrate extreme distress during transitions (American Psychiatric Association, 2013; Plimley and Bowen, 2007). This is especially true as children with autism enter secondary school. This is because he/she is required to be more independent,

yet at the same time be part of a larger group. As Plimley and Bowen (2007) point out, this can be highly confusing to children with autism. One reason for this is that as older children with autism interact with different peers, they have to navigate the world as teenagers. That means that among other things, they are expected to follow the norms of the group (Plimley and Bowen, 2007). But if a child, or a teenager, with autism, fails to follow or understand the unwritten code of social rules, then this can lead to isolation and also possibly to bullying (Plimley and Bowen, 2007). As an individual with autism moves into adulthood, he/she makes transitions from a very structured school environment with predicable patterns to an ever changing, unfamiliar environment. So moving into adulthood can enhance a level of anxiety for the individual with autism (Plimley and Bowen, 2007).

At this point, to clearly see the impact of the social skills deficit on children with autism, I will briefly discuss one study conducted by Müller, Schuler and Yates (2008). Müller and his colleagues (2008) interviewed eighteen adults with Asperger syndrome and other autism spectrum disorders. The adults were asked to describe their experiences 'navigating their social worlds'. The adults described their difficulties in initiating social interactions, difficulties with communication and feeling a sense of social isolation. The result was that all but one participant placed a great emphasis on isolation. Most described a sense of isolation that permeated from childhood through adulthood. For example, Müller and colleagues (2008) described some of the interview responses as follows:

> In recalling their childhood experiences, several described watching other children play and simply failing to grasp the social mysteries of how to join in. The workings of the social world seemed incomprehensible to them. Although several participants described a slow and painful learning process, whereby they were eventually able to establish one or two relationships with peers, most described ongoing social frustration…Several described themselves as depressed and/or anxious as a result of their social isolation. (pp. 177-179)

The study also highlighted the social anxiety and stress that individuals with autism have. In this case, Müller and colleagues (2008) pointed out that the participants' feelings of loneliness intensified as they grew older. Müller and colleagues (2008) emphasized that although the individuals in their study struggled with navigating their social world, they still longed for intimacy and social connectedness. They also expressed a desire to develop a greater social-awareness and self-awareness. (For further readings in the area of depression and anxiety in individuals with autism, see also Gillott et al., 2001; Kim et al., 2000; Stewart et al., 2006; and Tantam, 2000.) From such studies, we can see that it is

through understanding the perspectives of individuals with autism (who have faced the day-to-day challenges of dealing with a social skills deficit) that we can understand and appreciate the need for interventions that can support them in navigating their social world.

This quick overview of how the impairments in social interaction pose challenges throughout the school years and into adulthood is by no means exhaustive. The discussion presented so far merely scratches the surface of the deep impact that difficulties with social interaction, or social competence, poses on individuals with autism.

1.2.4 Social competence and autism

As a child with autism develops and improves his or her social skills, there appears to be a correlation with long term adjustment, peer acceptance and social competence (Crick and Dodge, 1994; Ozonoff and Miller, 1995; Semrud-Clikeman, 2007). As can be seen from the above description of the challenges that individuals with autism face in their social skills, one can gain a better understanding of how important interventions that target these skills are.

In this regard, Semrud-Clikeman (2007) offers an interesting look at social competence. She defines social competence as "an ability to take another's perspective concerning a situation and to learn from past experience and apply that learning to the ever-changing social landscape (p. 1)." This involves the ability to respond to social situations flexibly. Semrud-Clikeman further states that "social competence is the foundation upon which expectations for future interactions with others are built and upon which children develop perceptions of their own behaviour (p. 2)." Similarly, Crick and Dodge (1994) developed a model for understanding social competence. In this model, a child has to encode relevant social cues, whether verbal or nonverbal and whether obvious or hidden. The child must then interpret the cues to determine what he/she wants from the interaction. The child then compares the current situation to past situations, his reaction to those situations, as well as to the results. The child then decides upon a response to the situation and in the final step, follows through with the action. In this case, from Crick and Dodge's model, one can detect the complexity of social competence. For a child with autism, each of the stages of social competence can be quite cumbersome and often confusing. Social competence develops over time. As a child develops, new skills are developed based upon previously learned skills and knowledge. In infancy, a child learns

about the world through their senses. The first social experience of an infant is when he attaches a certain voice, touch or smell to an important person such as the mother, father or caretaker (Semrud-Clikeman, 2007).

Even perspective taking begins in these early months. For example, when an infant follows their caretaker's look towards an object coupled with a smile, he begins to understand that the object being looked at is a desired object and then the infant reaches for it. This cognitive skill lends itself to perspective taking when the child reaches three and four years of age (Phillips et al., 2002). This shows that social competence involves the important skill of perspective taking. Very young children start out thinking that the world revolves around them. They soon come to realize that others may not perceive a situation in the same way as they do (Semrud-Clikeman, 2007). Perspective taking involves the ability to understand the feelings, desires and beliefs of another person. Which in turn, also involves being able to understand and express one's own feelings, desires and beliefs (Semrud-Clikeman, 2007).

In summary, the development and improvement of social skills correlates with long term adjustment (Ozonoff and Miller, 1995). Interventions specifically addressing the social skills of individuals with autism can help them move along the trajectory towards social competence and peer acceptance. This means that without these interventions, children with autism will continue to have difficulties in participating in a shared social world.

From the hitherto discussion, I believe that we have gained an understanding of the research problem i.e. the social skills of children with autism. In what follows, I will explain the terms that will be used in this study, followed by the structure, aims and objectives of the thesis.

1.3 Definition of terms

There are several key terms used in the present research. These include Autism Spectrum Disorders (ASD), social skills, imitation, intervention, video modelling, first-person perspective, third-person perspective, and typically developing children.

1.3.1 Autism Spectrum Disorders (ASD)

Autism Spectrum Disorders (ASD) (i.e. autism) is a neurodevelopmental disorder that until recently, was referred to as having three core features: impairments in social

interaction, communication, and a restricted repertoire of activities and interests (American Psychiatric Association, 1994). Currently, autism is a neurodevelopmental disorder that affects social communication and social interaction coupled with restricted, repetitive patterns of behaviour, interests, or activities (American Psychiatric Association, 2013).

1.3.2 Social Skills

Social skills is an overarching term that includes verbal and nonverbal communication skills, emotional regulation, flexibility, problem solving, perspective taking, and interpersonal skills. It includes the communication skills of initiating a conversation, joining in on a conversation, verbal turn-taking, and listening skills. It also includes play skills such as initiating play, joining in on existing play, turn-taking, sharing, reciprocal play, imaginative play, and cooperative play.

1.3.3 Imitation

Imitation is the act of copying or imitating someone's actions, gestures and/or verbalizations. An example of this is when a child watches an adult put their hands up to cover their eyes, followed by uncovering them in the game of 'peek-a-boo'. The child then imitates the same actions he observed.

1.3.4 Intervention

Intervention is a term used for a systematic procedure or plan to address a particular need or problem. For example, a social skills intervention is a plan to help an individual learn a particular social skill.

1.3.5 Video Modelling

Video modelling is a process where a person is first asked to watch a video containing a target skill modelled by either an adult or a peer, followed by an opportunity to imitate the behaviour modelled (Bellini and Akullian, 2007; Graetz, Mastropieri, and Scruggs, 2006; Sigafoos, O'Reilly, and de la Cruz, 2007).

1.3.6 First-person Perspective

First person relations can be understood by the following model "I → X," where "I" represents the perceiver, "→" represents directional activity, and "X" represents an object (Gomez, 1996, p. 130). When a person is looking at something from the first-person

perspective, the person observes an activity directed at an object by the perceiver itself (i.e. the perceiver picks up object X).

1.3.7 Third-person Perspective

Third person (perspective) relations can be understood by the following model "O → X," where "O" is a person different than the perceiver, "→" represents directional activity, and "X" is the object of the other person's activity (Gomez, 1996, p. 130). With this model in mind, when a person is looking at something from the third-person perspective, the person observes another person acting on an object (i.e. person O picks up object X).

1.3.8 Typically Developing Children

Typically developing children are children who are progressing along in their development as expected and who do not have any known diagnosis.

Having explained some of the important terms that will be used in this study, I will now describe the structure of the thesis, its aims and objectives.

1.4 Structure of the thesis

This thesis contains seven chapters. *Chapter 1* began with the research problem, followed by the historical background of autism, its diagnostic criteria, prevalence and core features. Second, the chapter discussed the deficit in social skills for individuals with autism, play skills and social competence. Third, the structure of the thesis was described, including the primary and secondary aims, and the steps necessary to achieve these aims.

Chapter 2 describes types of interventions that address the social skills deficit in children with autism, followed by a description of recent video based instructions, more specifically video modelling. The chapter contains an extensive systematic literature review on video modelling from the first-person perspective and the third-person perspective in relation to the social skills of children with autism. Finally, this chapter defines the current gaps in the body of research in this area.

Chapter 3 will provide the theoretical framework for the theories that underpin this research. The chapter will provide an in-depth discussion on the methods for the first experiment in this research, including the selection of the research method, ethical

considerations, participants, measures, procedures, experimental design and data analysis. Finally, a methodology diagram of the entire research process will be provided.

Chapter 4 will provide an in-depth discussion for the second experiment in this research, including the ethical considerations, participants, measures, procedures, experimental design and data analysis. Finally, a methodology diagram of the entire research process will be provided.

Chapter 5 will present the descriptive findings of the data obtained in the first school experiment. First, quantitative and qualitative results across participants and the frequency of the social behaviours that the participants' demonstrated will be presented. Second, information gathered from a visual inspection of the data will be presented. Third, the results from the feedback received from the stakeholders in this study—the participants, their parents and their teachers—will be presented.

Chapter 6 will present the quantitative and qualitative data obtained in the second school experiment. First, quantitative and qualitative results across participants and the frequency of the social behaviours that the participants' demonstrated will be presented. Second, information gathered from a visual inspection of the data will be presented. Third, the results from the feedback received from the stakeholders in this study—the participants, their parents and their teachers—will be presented.

Chapter 7 will discuss the implications of the results of this study. This will include a review of the results in relation to existing research; how this study addressed the gap in the literature; limitations to the study; practical applications of the study; generalizability of the study; recommendations in relation to special education practice, policy and theory; and finally, recommendations for future research.

1.5 Research aims

The research aims for this study are directly linked to the research questions. The research questions and research design will be discussed in detail in chapters 3 and 4.

The *primary aim* was to identify whether video modelling or point-of-view video modelling would be more effective in increasing the social skills of primary children with autism in the UK, specifically their verbal and action imitation skills. The *secondary aim*

was to understand how the outcomes of this study could be applied into current classroom interventions for individuals with autism.

In what follows, I outline the steps that are necessary to achieve these aims, in the process of conducting this research study:

1.	***To implement a social skills intervention at two school settings*** ▪ Develop a video and script for two play sets across two school settings ▪ Film the video from two perspectives (first-person and third-person)
2.	***To develop questionnaires to be completed at the end of the study by the following stakeholders:*** ▪ Parent ▪ Participant ▪ Teacher
4.	***To review all data obtained*** ▪ Participant behaviours following video viewing ▪ Questionnaires from all stakeholders ▪ Social skills checklists
5.	***To critically analyse the data.***
6.	***To discuss the outcomes of this study in regards to current classroom interventions for children with autism.***

1.6 Summary

This chapter has provided the framework for understanding the research problem—the social skills of children with autism. The historical background of autism, including its diagnostic criteria, prevalence and core features have been defined. Further, an in-depth discussion on the social skills deficit for individuals with autism has been provided. Finally this chapter presented the aims of this study. The next chapter will provide a systematic literature review on video modelling from the first-person perspective and the third-person perspective in relation to the social skills of children with autism.

Chapter 2. Systematic Literature Review

2.1 Introduction

The purpose of this chapter is to identify the current gaps in the research through a systematic literature review. In the first section of this chapter, a brief review of the background for this study will be provided. The second section will briefly describe some of the social skills interventions for individuals with autism. The third section will outline the method and procedure for the comprehensive systematic literature review that was conducted on video modelling from the first-person perspective and the third-person perspective in relation to the social skills of children with autism. Finally, the fourth section identifies the gap in the current body of research.

2.2 Background for the study

As we discussed in chapter 1, social impairment in students with autism is characterized by a lack of seeking to share enjoyment and interest with others; by a lack of showing, bringing, or pointing out an object of interest; and a lack of social and emotional reciprocity (American Psychiatric Association 2000, 2013). Individuals with autism demonstrate impairments in turn-taking skills, joint attention, pretend play, and maintaining social interactions. This is rooted in the difficulty they face in understanding, predicting, and responding to the social, emotional, and communication behaviours of others. These difficulties can be linked to deficits with theory of mind, mind-blindness, weak central coherence and executive function (Baron-Cohen, 1997; Baron-Cohen et al., 2000; Baron-Cohen, Leslie, and Frith 1985; Frith, 1989; Happe and Frith, 1996; Semrud-Clikeman, 2007; Pennington and Ozonoff, 1996; Repacholi and Slaughter, 2003, Baron-Cohen, Tager-Flusberg and Cohen, 1993). Social interactions require an ability to process ever-changing input from context, language, and emotions. Individuals with autism often interpret situations literally, or from their own set of beliefs, which often leads to improperly understanding the social situation at hand (Semrud-Clikeman, 2007).

The lack of social interaction skills can hinder the development of intelligence, language, and other skills, which are vital to typical childhood development (Guralnick, 1981). Individuals with autism often remain socially isolated even though they are in a socially-rich environment (Goldstein et al., 1992; Gresham and Elliott, 1984; Müller, Schuler and Yates, 2008; Pierce and Schreibman, 1997a; Wolfberg and Schular, 1993). Without interventions specifically addressing social skills, these social deficits can lead to social

isolation and the failure of individuals with autism to interact in typical environments which enables them to develop social relationships (Gaylord-Ross, Haring, Breen, and Pitts-Conway, 1984; Kanner, 1943; Sasso, Garnson-Harrell, and Rogers, 1994; Strain, 1981). In this regard, for example, Semrud-Clikeman (2007) proposes that due to the challenges children with autism face with communication, social skills, and behaviours, intervention programs should be intense and should preferably begin when the child is still quite young. In order to reduce the amount of time adults spend providing this level of intervention, peers in the natural environment, such as the classroom, home or community setting, are often trained in specific social interaction strategies to use with children with autism. This type of intervention is known as peer mediation. Left to their own devices, children with autism are less likely to attend to their peers and imitate their actions when they are in an integrated, mainstream setting (DiSalvo and Oswald, 2002). Without prompting or facilitation, children with autism may not engage with play materials or imitate a peer. Interventions using prompting and instruction result in increased play skills in children with autism (Attwood, 1998, Brown and Murray, 2001; Koegel et al., 2001; Lewis and Boucher, 1995). Research indicates that peer-mediation intervention helps individuals with autism improve social interaction skills, increase initiations, develop friendships, and increase acceptance among typical peers (Garrison-Harrell and Kamps, 1997; Kamps et al., 2002; Morrison, Kamps, Garcia, and Parker, 2001; Peck, Donaldson, and Pezzoli, 1990).

2.3 Social skills interventions for students with autism

Much research has focused on the development of social skills in students with autism through the following intervention models: adult mediated, peer mediated, technological delivery, peer training, parent training, social skills groups, applied behavior analysis (ABA), pivotal response training, self-management techniques, Social Stories™, and direct instruction. Each of these models has been proven successful in eliciting social skills in students with autism. Additionally, the National Standards Report (The National Autism Center, 2009) identified modelling (live and video), peer training package (peer initiation, peer-mediated, etc.), self-management (checklists, visual prompts, etc.) and story-based intervention package (Social Stories™) as established treatments, among others, for individuals identified with Autism Spectrum Disorder.

2.3.1 Imitation interventions

Interventions focused on the imitation skills for children with autism include discrete trial training (DTT), and naturalistic approaches such as incidental teaching, milieu teaching, pivotal response training (PRT) and reciprocal imitation training (RIT) (see further on this Ingersoll, 2008 and Ingersoll, B., and Schreibman, L., 2006).

2.3.2 Video-based interventions

A relatively new area of research in social skills interventions for individuals with autism is that of video-based interventions (Rayner, Denholm and Sigafoos, 2009). This is the focus of the current research. Specifically, this has to do with the use of video modelling filmed from either the first-person perspective or the third-person perspective in relation to the social skills of children with autism.

Video-based instruction taps into a relative strength of individuals with autism in how they process visual stimuli (Ayres and Langone, 2005; McCoy and Hermansen, 2007; Nikopoulos and Keenan, 2006; Plimley and Bowen, 2006; Sigafoos, O'Reilly and de la Cruz, 2007). As pointed out by Bellini and Akullian (2007), video based instructions can be seen as socially valid, as watching videos are a socially acceptable activity for typically developing individuals. Furthermore, video-based instruction can be seen as a non-invasive form of intervention for individuals with autism (Bellini and Akullian, 2007). Although video-based interventions for students with autism is a relatively new area of research, the concept behind this type of learning is related to the work of Albert Bandura and his 'social learning theory' (Bandura, 1969, 1976, 1977). The social learning theory is based on an individual learning a new behaviour by observing a model performing that behaviour. Observational learning involves four steps: attention, remembering what has been seen, producing the behaviour, and responding to reinforcement (Semrud-Clikeman, 2007). Bandura proposed that observational learning happens through three models: by watching other people perform a behaviour (a live model), verbal instruction on how to perform a behaviour and through a real or fictional character that demonstrates the behaviour through the media, a video, etc. Bandura's *Social Learning Theory* will be discussed further in the next chapter in §3.2.4.

Video-based interventions include video modelling, point-of-view video modelling, video self-modelling, as well as video prompting, video priming and computer-based video instruction (Rayner, Denholm and Sigafoos, 2009; Shukla-Mehta, Miller and Callahan, 2010). Video-based instruction has been identified as an intervention which promotes

generalization of social skills (Charlop-Christy and Daneshvar, 2003; Hine and Wolery, 2006; Nikopoulos and Keenan 2004b; Paterson and Arco, 2007; Schreibman, Whalen and Stahmer, 2000).

In what follows, I will explain how the use of video-based instruction is described in some of the literature. In a study by Sturmey (2003), video was described as a tool to draw one's attention to the behaviours being modelled, and at the same time provide stimulus control. In another study, Klin et al. (2002) found that people with autism can become distracted with irrelevant items in a situation, such as objects, and ignore the more essential aspects of the interaction such as facial and body gestures. Individuals with autism are also known to have difficulty attending to relevant details in their environment. Rather than scanning their environment as a whole to identify and focus on important details, they focus on smaller details which may not be the most important ones to attend to. This often leads to missing out on other important things that are happening in their environment. This is often referred to as 'overselectivity'. At times, overselectivity is due to distractions in the environment or a heightened sensitivity to one of the senses (i.e. auditory, tactile, olfactory, and visual). In this case, video-based interventions help address the challenges individuals with autism face when they do not attend to the most salient details in their environment.

2.3.2.1 Types of video modelling

Here I will describe briefly video modelling, video self-modelling and point-of-video video modelling. First, video modelling is a process where a person is first asked to watch a video containing a target skill modelled by either an adult or a peer, followed by an opportunity to imitate the behaviour modelled (Bellini and Akullian, 2007; Graetz, Mastropieri, and Scruggs, 2006; Sigafoos, O'Reilly, and de la Cruz, 2007). Second, video self-modelling uses the individual being instructed as the model in the videotape. Similar to video modelling, video self-modelling is a process where the individual is asked to watch the video of the target behaviour being modelled, followed by an opportunity to imitate that behaviour (Bellini, Akullian, and Hopf 2007; Graetz, Mastropieri, and Scruggs 2006). Third, point-of-view video modelling is very different from video modelling and video self-modelling in that it is filmed in the context of an activity from the visual perspective (at eye level) of the individual who is being instructed (Hine and Wolery, 2006; Schreibman et al., 2000). The video provides a picture of what they are supposed to do from the beginning step until the completion of the task. This method

promotes visual comprehension and allows for familiarity with the materials or settings in the video (Shukla-Mehta, Miller, and Callahan, 2010).

As Shukla-Mehta, Miller and Callahan (2010) point out, video instruction has become recognized as a form of intervention since the 1970s. Video instruction has been used to teach a variety of social, academic, behaviour and functional skills to students with autism spectrum disorders, resulting in positive intervention effects (Rayner, Denholm, and Sigafoos, 2009). In this case, for example, it has been used as a stand-alone intervention (D'Ateno, Magiapanello, and Taylor, 2003; MacDonald, Clark, Garrigan, and Vangala, 2005; Nikopoulos and Keenan, 2004b, 2007), as an intervention which included instructional prompts and/or reinforcement (Charlop and Milstein, 1989; Charlop-Christy and Daneshvar, 2003; Kroeger, Schultz, and Newsom, 2007; Paterson and Arco, 2007; Taylor, Levin, and Jasper, 1999), as well as part of a multi-element intervention package (Apple, Billingsley, and Schwartz, 2005; LeBlanc et al., 2003; Maione and Mirenda, 2006; Nikopoulos and Keenan, 2003, 2004a; Reeve, Reeve, Townsend, and Poulson, 2007; Scattone, 2008; Simpson, Langone, and Ayers, 2004).

As stated earlier, video-based interventions help address the challenges individuals with autism face when they attend to details which are not the most salient details in their environment, otherwise known as 'overselectivity'. Video modelling provides an opportunity to break down a certain skill into isolated steps while providing accurate demonstrations of a targeted skill. Additionally, video modelling allows for the modelled targeted behaviour to be presented in a repetitive fashion. This serves several purposes: reducing the demand for the teacher or staff to provide this level of repetition, providing a routine which is a preferred learning style for individuals with autism, and increasing the likelihood of skill acquisition through multiple repetitions.

Having looked at types of social skills interventions for children with autism, specifically in the area of video-based interventions, I want to discuss the comprehensive systematic literature review that was conducted on video modelling from the first-person perspective and the third-person perspective in relation to the social skills of children with autism.

2.4 Systematic literature review on video modelling

2.4.1 Method

A comprehensive systematic literature review was conducted to identify and critically analyse relevant studies in the area of video modelling. This review is based on the systematic method of Petticrew and Roberts (2008). This review answers the following key questions:

1. How has video modelling been used to promote the social skills of individuals with autism?
2. What types of models have been used in video modelling to promote the social skills of individuals with autism?
3. What are the outcomes of video modelling (third-person perspective) and point-of-view video modelling (first-person perspective)?

An electronic search was conducted using the following databases: Education Resources Information Center (ERIC), PsycINFO, Web of Knowledge, and the British Education Index (BREI). Searches were conducted using a combination of the following key words: *autism, social skills, social development, social cognition, social skills intervention, video modelling, video based instruction, video based intervention, and video.* In total, 152 articles were identified in the initial searches.

2.4.1.1 Inclusion criteria

Studies were included in the systematic literature review based on the following inclusion criteria: First, the studies must have assessed the use of video modelling filmed from either the third-person perspective (with another person as the model) or the first-person perspective (point-of-video modelling where body parts such as the hands or feet are shown in the video rather than the whole person). Second, participants involved must have a diagnosis of autism or autism spectrum disorder. Third, the focus of the study must target social skill development or pre-requisite skills for social skill development. Fourth, the articles must have been published in English in a peer reviewed journal. Fifth, the articles must be research-based, whether that be qualitative or quantitative.

2.4.1.2 Exclusion criteria

Studies were not included in the systematic literature review based on the following exclusion criteria: First, studies that are not research-based were not included. Second, articles that do not clearly articulate the research design, methods, participants and results

of the study were not included. Third, studies assessing the use of video self-modelling and *in vivo* (live) modelling were not included. Fourth, studies in which video modelling was combined with another social skills intervention (i.e. video modelling and social stories) were not included.

Based on the inclusion and exclusion criteria, 23 articles were identified. A manual search was then conducted using the reference lists of the 23 identified articles. The purpose of this search was to discover any studies not originally identified in the first two steps of this comprehensive systematic literature review. Please refer to Table 1 (beginning on the next page) for the identified studies from the systematic literature review.

2.4.1.3 Component analysis

Having identified the core articles in the area of video modelling from the first-person perspective and the third-person perspective in relation to the social skills of children with autism, I will now describe the component analysis. In an effort to unpack the articles and to better understand the components that were included in the articles identified, a component analysis was conducted. The analysis focused on the type of video models used (i.e. adult, peer, male, female), the settings involved (i.e., school, home, clinic) and the type of video modelling intervention styles. The analysis also looked at the theoretical underpinnings of the articles identified. The analysis also uncovered the types of screening tools used in the research studies, the clarity of research questions in the studies as well as what type of input was obtained from key stakeholders in each of the studies. Following the discussion on the component analysis, the current gaps in the research identified will be presented.

2.4.1.3.1 Types of video models

I would now like to discuss the types of video models used in these articles. Twenty-three studies were included in this comprehensive literature review involving a total of 90 participants. Of the 90 participants, 71 were boys and 19 were girls. Eleven studies used male models only, 3 studies used female models only and 10 studies used both male and female models. Of the 23 studies, 6 studies involved only one participant, while 18 studies had more than one participant in the study. Only one study (Kroeger, Schultz and Newsom, 2007) compared interventions delivered in a group setting. The models used in the 23 studies ranged from clay animation, adults, peers, live modelling to point-of-view video modelling (POVM). Of the 23 studies, 11 utilized adults as the model; 6 studies

Table 1. Identified studies from the comprehensive systematic literature review

Study	Research Design	Participants	Targeted Skills	Model	Setting	Dependent Variable(s)	Independent Variable(s)	Conclusion/ Results
Apple, Billingsley and Schwartz (2005)	MBL across participants	3 boys, 1 girl Ages 4 to 5 2 diagnosed with Autism; 2 with Asperger's Syndrome	Compliment-giving responses and initiations	Peers and adults	School	Frequency count of compliment-giving initiations and responses per observation period	3x/week participants watched 3 video segments of compliment-giving responses (rotated daily at random) plus one video with 6 examples of compliment-giving initiations. VM with tangible for experiment 1; VM with self-management for experiment 2.	Compliment-giving and response skills increased through VM and reinforcement (E1) and with self-management (E2).
Boudreau and D'Entremont (2010)	MBL across subjects	2 boys Age 4 Both diagnosed with Autism	Modelled actions, unmodelled actions, scripted verbalizations and unscripted verbalizations	Adult	Clinic	Number of modelled actions, unmodelled actions, scripted verbalizations and unscripted verbalizations	4 VM sessions, followed by 3 VM sessions with reinforcements, followed by reinforcement sessions without the video. Sessions conducted 1-3xs per week over 3 months.	VM increased modelled actions and scripted verbalizations for both participants. Skills were generalized by both participants. Short-term maintenance of skills for 1 and long-term maintenance for the other participant.
Cardon and Wilcox (2011)	MBL across participants and two treatment conditions	6 boys Ages 20-48 months All diagnosed with Autism	Object imitation	Adult	Clinic	Comparison of Reciprocal Imitation Training (RIT) and VM 3 participants received the RIT intervention, the remaining 3 received the VM intervention (randomly assigned) Percentage of object (toy) imitation.	Extended baseline followed by intervention 3 times per week for 5 weeks, 30 minutes each session. Maintenance/generalization probes at 1 and 3 weeks post treatment. Participants matched according to age, adaptive behaviour, language and autism severity for comparison of dyads.	Participants increased object imitation skills with both treatment conditions (RIT and VM). Skills rapidly increased through VM, where a steady increase of skills was observed through RIT. Skills maintained and generalized at 1 and 3 weeks post treatment. Imitation skills were assessed on the Motor Imitation Scales pre- and post-treatment. Results indicate an increase in imitation skills for both treatment conditions.

MBL = multiple baseline design; E1 = experiment 1; E2 = experiment 2; VM = video modelling; POVM = Point-of-view video modelling, MR = Mental Retardation; ADHD = Attention Deficit Hyperactivity Disorder

Study	Research Design	Participants	Targeted Skills	Model	Setting	Dependent Variable(s)	Independent Variable(s)	Conclusion/ Results
Charlop et al. (2010)	MBL across participants	3 boys Ages 7 to 11 All diagnosed with Autism	Verbal comments, intonation, gestures, and facial expressions	Two adults	School	Percentage of opportunities where verbal comments, intonation, gestures, and facial expressions occurred	Students viewed video twice per session without prompting or additional reinforcers. Video consisted of 3 scenarios, alternately repeated 3x, for a total of 9 scenarios.	All four target behaviours were achieved for all participants after viewing the video only three to four times.
Charlop-Christy, Le and Freeman (2000)	MBL across participants; within child across 2 modelling conditions; and within each modelling condition across the 2 tasks	4 boys, 1 girl Ages 7 to 11 All diagnosed with Autism	Specific to child: expressive labelling of emotions, independent play, spontaneous greetings, oral comprehension, conversational speech, and cooperative play	Adults	School (therapy room)	Comparison of VM with in vivo modelling	VM modelling and in vivo modelling. Prompting and reinforcement for correct responding during BL. Prompts for on-task behaviour during VM and praise for attending to the model or video.	VM led to quicker acquisition of targeted skills than in vivo modelling. Generalization after VM but not after in vivo modelling.
Corbett (2003)	Multiple probe across behaviours	1 boy Age 8 Diagnosed with Autism and mild MR	Perception of emotion (happy, sad, angry, afraid)	Peers	Home	Percentage correct identifying emotions (happy, sad, angry, afraid)	VM containing 5 examples of each emotion presented daily to the participant. Social reinforcement for positive responding, corrective feedback for incorrect responses followed by emotion labelling and role-play.	Quick and steady rate of skill acquisition and maintenance of the four emotions.
D'Ateno, Mangiapanello and Taylor (2003)	MBL across 3 response categories	1 girl Age 3 Diagnosed with Autism	Scripted and unscripted verbal statements, modelled and unmodelled motor responses.	Adult	School	Number of scripted and unscripted verbal statements. Number of modelled and unmodelled motor responses.	Access to play materials 1 hour after viewing video (VM). No reinforcement, prompting or correction procedures used.	VM led to rapid acquisition of verbal and motor responses for the 3 response categories.
Gena, Couloura and Kymissis (2005)	MBL across participants	2 boys, 1 girl Ages 3 to 5 All diagnosed with Autism	Affective behaviour: sympathy, appreciation and disapproval	Peer (VM) Adult (in vivo)	Home	Comparison of VM with in vivo modelling	VM and in vivo modelling. Verbal prompting by the therapist was used as a corrective procedure for both interventions.	Both interventions increased all three areas of affective responses for all participants. Generalization across untrained people, settings and time.

MBL = multiple baseline design; E1 = experiment 1; E2 = experiment 2; VM = video modelling; POVM = Point-of-view video modelling, MR = Mental Retardation; ADHD = Attention Deficit Hyperactivity Disorder

Study	Research Design	Participants	Targeted Skills	Model	Setting	Dependent Variable(s)	Independent Variable(s)	Conclusion/ Results
Hine and Wolery (2006)	MBL across participants and behaviours	2 girls Ages 30 months and 43 months Both diagnosed with Autism	Play actions for two sets of behaviours: gardening and cooking.	Adult hands (POVM)	School	Number of modelled play actions for the gardening and cooking behaviour sets.	Three segments: daily probes for modelled behaviour, POVM and daily practice. Verbal praise and tangible rewards for on-task behaviour.	Both participants imitated modelled play actions for the two scripts (gardening and cooking). Participants displayed new play behaviours in the absence of reinforcers or cues. Skills generalized to untrained materials for both tasks and into the classroom for the gardening task only.
Kleeberger and Mirenda (2010)	MBL across 3 imitation activities	1 boy Age 4 Diagnosed with Autism	Gross motor, finger play and toy play actions.	3 adults	Home	Percentage of gross motor, finger play and toy play actions.	VM once daily. Participant watched three video examples. Components added: highlighting critical aspects of the video, prompting, fading, and social reinforcement.	Imitation did not increase with VM or VM with highlighting of critical aspects of the video. Once VM + highlighting + prompting/fading + reinforcement were used, imitation steadily increased.
Kroeger, Schultz and Newsom (2007)	Comparison of video modelling (direct teaching group) versus play group.	9 boys, 4 girls (direct teaching group) 11 boys, 1 girl (play activities group) Ages 4 to 6 All diagnosed with Autism	Initiating, responding, social interactions and prosocial behaviours.	Two peers (male) Ages 5 and 7	Clinic	Mean number of behaviours for initiating, responding, interacting, and prosocial behaviours.	Direct teaching group and play activities group. Both groups comprised of "hello" circle time, playtime* and "goodbye" circle time. *Direct teaching group received VM followed by playtime. Groups met 3x/week for 5 weeks, 1 hour each session. Prompting and reinforcement for both groups.	Direct teaching group with VM resulted in a higher increase of prosocial behaviours than the play activities group.
MacDonald et al. (2005)	Multiple probe design within child across play sets	2 boys Ages 4 and 7 Diagnosed with PDD-Autism	Scripted behaviours and scripted play actions.	Adult	School	Mean number of scripted verbalizations and play actions	VM twice each session. 1 video for each play set presented in the following order for each participant (the town, the ship, the house). No prompting or reinforcement delivered.	Rapid acquisition of verbal and play actions for both participants. Unscripted play did not emerge for the participants.

MBL = multiple baseline design; E1 = experiment 1; E2 = experiment 2; VM = video modelling; POVM = Point-of-view video modelling, MR = Mental Retardation; ADHD = Attention Deficit Hyperactivity Disorder

Study	Research Design	Participants	Targeted Skills	Model	Setting	Dependent Variable(s)	Independent Variable(s)	Conclusion/ Results
MacDonald et al. (2009)	MBL across 3 play sets	3 boys, 1 girl Ages 5 and 7 (2 boys with autism) 1 boy and 1 girl, ages unknown, typically developing peers	Scripted verbalizations, scripted play actions, unscripted verbalizations, unscripted play actions, cooperative play, and reciprocal verbal interaction chains.	2 adults	School (testing room)	Numbers of scripted verbalizations, scripted play actions, unscripted verbalizations, unscripted play actions, cooperative play, and reciprocal verbal interaction chains.	Participant with autism paired with typically developing peer to watch VM followed by opportunity to demonstrate script and actions from video.	Participants gained scripted verbalizations and play actions quickly. Unscripted verbalizations, reciprocal verbal interactions and cooperative play increased for all participants. Skills maintained at one-month follow-up.
Maione and Mirenda (2006)	MBL across 3 play activities	1 boy Age 5 Diagnosed with Autism	Social language: verbalizations, scripted and unscripted verbalizations, initiations and responses.	2 adults	Home	1) The total number of verbalizations, 2) the frequency of scripted and unscripted verbalizations and 3) the frequency of initiations and responses.	VM: Participant watched three one-minute video vignettes of each target play activity daily. Activity sessions held 2-3 times per week 30-60 minutes following the VM session to record target behaviours observed.	VM increased social language (scripted and unscripted) in 2 of 3 activities. Initiations increased considerably more than responses through VM. In order to demonstrate a stable increase in social language for the third activity, video feedback and prompting were added.
Nikopoulos and Keenan (2003)	Multiple-treatment design for 6 participants A-B design for 1 participant	6 boys, 1 girl Ages 9 to 15 Diagnoses: 2-Autism 2-Autism and profound MR 1-Autism, profound MR and Epilepsy 1-Asperger's Syndrome and ADHD	Social initiation and appropriate play skills.	Peer, familiar adult and un-familiar adult	School	Latency to social initiation and time spent in appropriate play.	VM: Students viewed video once. Video contained one of three models. VM and VSM was used for one participant only.	VM enhanced initiation skills and appropriate toy play for 4 out of 7 participants. Generalization across settings, peers and stimulus materials for the above 4 participants. Maintenance of skills at 1 and 2 month follow-up sessions for the 4 participants. 3 did not participate in social initiation.

MBL = multiple baseline design; E1 = experiment 1; E2 = experiment 2; VM = video modelling; POVM = Point-of-view video modelling, MR = Mental Retardation; ADHD = Attention Deficit Hyperactivity Disorder

Study	Research Design	Participants	Targeted Skills	Model	Setting	Dependent Variable(s)	Independent Variable(s)	Conclusion/ Results
Nikopoulos and Keenan (2004)	MBL across participants	3 boys Ages 7 to 9 All diagnosed with Autism	Social initiations, Reciprocal play	Peer and adult	Clinic	Latency to social initiation and mean time engaged in reciprocal play with each toy.	VM with some modifications and changes in stimulus materials.	Social initiation and reciprocal play skills were enhanced through VM for all participants. Skills were maintained at 1 and 3-month follow-up sessions.
Nikopoulos and Keenan (2007)	MBL (E1) A-B design (E2)	E1: 3 boys Ages 6 to 7 E2: 1 girl, age 7 All diagnosed with Autism	Social initiation, reciprocal play, and imitation	Peer (with learning difficulties and average social interaction skills)	School (experi-mental setting)	Latency to social initiation and to imitative responses, and total time engaged in reciprocal play.	Students viewed 1 of 4 videos 2-3 sessions each day. Videos differed by increasing the number of tasks from 1 to 3 behaviours. The final video presented 3 different tasks than the previous 3 videos.	All four participants built a sequence of social behaviours through VM. Skills generalized across peers as well as stimuli. Skills maintained after a 1- and 2-month follow-up period.
Ozen, Batu, and Birkan (2012)	MBL across behaviours	3 boys Age 9 All diagnosed with Autism	Eye contact, appropriate behaviour for utterances and scenarios, appropriate emotions, voice quality, speaking clearly, saying words in the scenario.	3 adults	Clinic	Percent of correct responses across 3 behaviours.	VM in a small group arrangement with verbal prompting Sessions took place 1x/week on the weekends.	All participants learned their roles for the 3 behaviours sets. Observational learning showed that participants also learned the roles of their partners. Skills maintained at 2-week follow-up.
Palechka and MacDonald (2010)	MBL across participants and modelling conditions	2 boys, 1 girl Ages 4 to 5 All diagnosed with Autism	Scripted actions, vocalizations, and attending to videos and toys.	Adult (ICV) Clay animation (CCV)	School (therapy room)	Occurrences of scripted vocalizations, scripted play actions, attending to the video, and attending to the toys.	Comparison of instructor created video (ICV) with an adult model versus commercially created video (CCV) with clay animation and sound effects removed.	Targeted skills increased more rapidly for 2 participants through ICV. One participant increased skills equally through both video versions (ICV and CCV).
Reagon, Higbee and Endicott (2006)	A-B design across 4 play scenarios	1 boy Age 4 Diagnosed with Autism	Scripted play actions, scripted statements	Sibling (age 7)	School	Percentage of scripted play actions and scripted statements.	Participant and sibling watched video (VM) followed by play sessions without prompting, reinforcers or instructions.	Participant demonstrated scripted play actions and statements as a result of VM with his sibling as the model. Skills maintained. Skills generalized to new partners and a new setting.

MBL = multiple baseline design; E1 = experiment 1; E2 = experiment 2; VM = video modelling; POVM = Point-of-view video modelling, MR = Mental Retardation; ADHD = Attention Deficit Hyperactivity Disorder

Study	Research Design	Participants	Targeted Skills	Model	Setting	Dependent Variable(s)	Independent Variable(s)	Conclusion/ Results
Sancho et al. (2010)	Adapted alternating treatment design with reversal and multiple probe design across participants	1 boy, 1 girl Age 5 Diagnosed with Autism	Attending, imitation of actions, imitation of vocal scripts, unscripted play actions, scripted verbalizations, and unscripted verbalizations	POVM	School and home	Comparison of two different POVM interventions: *Video Priming:* POVM without prompts/ reinforcement for imitation and *Simultaneous POVM:* POVM with prompts/ reinforcement for imitation. Number of scripted and unscripted play actions, and number of scripted and unscripted verbalizations.	Participants exposed to each VM technique daily presented in a quasi-randomly selected order (ABBABAAB).	Both interventions were effective in increasing play skills and maintenance of play skills. Male participant responded equally to both VM interventions and maintained skills. Female participant gained scripted play actions more quickly with the simultaneous VM intervention. Generalization occurred for both only after video training with a second play set, resulting in generalization with the third play set.
Simpson, Lagone and Ayers (2004)	MBL across students for the use of embedded video and computer based instruction	2 boys, 2 girls Ages 5 to 6 All diagnosed with Autism and speech delay	Complying with teacher directions, sharing and use of appropriate social vocabulary.	Peers (without disabilities)	School	Number of unprompted social behaviors for following directions, sharing, and greetings.	Daily sessions of embedded computer based VM followed by 36 trials spread out over the school day.	Increased frequency of unprompted social skills for 3 of the 4 participants.
Tetreault and Lerman (2010)	MBL across behaviours (scripts)	2 boys, 1 girl Ages 4 to 8 All diagnosed with Autism	Eye contact and vocal behaviour	Adult conversant with POVM	Clinic	Number of correct exchanges of eye contact and vocal behaviour.	Point-of-view video modelling (POVM) plus food, POVM only, and least-to-most prompts	2 participants increased social behaviours. The authors consider the results inconclusive as to the effectiveness of POVM to teach social exchanges to children with autism.

MBL = multiple baseline design; E1 = experiment 1; E2 = experiment 2; VM = video modelling; POVM = Point-of-view video modelling, MR = Mental Retardation; ADHD = Attention Deficit Hyperactivity Disorder

used peers as the model; 3 studies combined a peer and an adult; 1 study involved an adult model *in vivo*; 1 study used clay animation for its model; and 4 studies utilized point-of-view video modelling. Of the 3 studies using POVM, one study included an adult conversant.

2.4.1.3.2 Settings

Having identified the models used in these studies, I want to take a look at the types of settings they took place in. Twelve of the studies were conducted in the school setting, four studies were conducted in the home setting, six studies were conducted in a clinic setting and one study was conducted in both the school and the home setting.

2.4.1.3.3 Types of Video Modelling Interventions

As already discussed, the aim of this study was to compare video modelling and point-of-view video modelling in order to see which was more effective on the social skills of primary children with autism. In light of this, it was important to identify which articles provided a comparison of video modelling interventions. Of the 23 studies, five provided a comparison of video interventions. Cardon and Wilcox (2011) compared reciprocal imitation training (RIT) [a behaviour intervention that teaches imitation skills to children with autism in a naturalistic environment] and video modelling (VM); Charlop-Christy, Le and Freeman (2000) and Gena, Couloura and Kymissis (2005) compared VM with *in vivo* modelling; Palechka and MacDonald (2010) compared instructor created video (ICV) to commercially created video (CCV); and finally Sancho et al. (2010) compared two different POVM interventions (video priming and simultaneous VM). The remaining 18 studies involved only one type of video modelling intervention method.

2.4.1.3.4 Theoretical Underpinnings

In this section, I will take a closer look at the theoretical underpinnings identified in the systematic literature review. The findings indicate that the majority of the interventions were based on behaviourist and cognitive-behavioural models. Of the 23 studies, five clearly identified the theoretical underpinnings for their research. Corbett (2003), Gena, Couloura and Kymissis (2005), Hine and Wolery (2006), and Ozen, Batu and Barkan (2012) base their research on the principle of observational learning which is rooted in the *Social Learning Theory* by Albert Bandura. The fourth study by Simpson, Lagone and Ayers (2004) based their research on the principle of anchored instruction, which is based

on the *Theory of Situated Cognition*. However, Simpson, Lagone and Ayers also mention observational learning in their study.

Although the remaining 19 studies do not clearly describe the theoretical underpinnings of their research, some general inferences can be made. For example, terminology used in nine of the articles is behaviourally based. To name a few: applied behavior analysis (ABA), response prompting, extrinsic reinforcement, operant mechanism, latency, establishing operations, forward chaining, antecedent events, discriminative stimuli, and the use of video modelling to reduce problem behaviours while increasing appropriate behaviours (Apple, Billingsley and Schwartz, 2005; D'Ateno, Mangiapanello and Taylor, 2003; Kleeberger and Mirenda, 2010; Maione and Mirenda, 2006; MacDonald et al., 2009; Nikopoulos and Keenan, 2003, 2004, 2007; and Tetrault and Lerman, 2010). Although the above mentioned articles are heavily rooted in a behavioural framework, they also align themselves to an observational learning framework. This leaves us with nine remaining articles which do not explicitly state which theoretical framework the given research is based upon (Boudreau and D'Entremont, 2010; Cardon and Wilcox, 2011; Charlop et al., 2010; Charlop-Christy, Le and Freeman, 2000; Kroeger, Schultz and Newsom, 2007; MacDonald et al., 2005; Palechka and MacDonald, 2010; Reagon, Higbee and Endicott, 2006; and Sancho et al., 2010). These remaining articles can easily fit within an observational learning framework based on the author's strong emphasis on observing behaviour and demonstrating learned behaviour. The theories underpinning the articles identified above, along with the theoretical underpinnings of this current research, will be discussed in a later section of this thesis (see §3.2).

2.4.1.3.5 Screening Tools

So far, we have unpacked the types of video models, settings, types of video interventions and theoretical underpinnings from the articles identified in the comprehensive systematic literature review. Now I would like to discuss the types of assessments that were administered as part of the research study as well as the assessments which researchers used to gather information to guide their intervention. Six of the studies clearly mentioned different assessments such as diagnostic, cognitive, adaptive, and intelligence assessment measures. These measures were either administered pre-intervention or pre- and post-intervention.

First, I would like to discuss the types of measures administered pre-intervention. Corbett (2003) administered the *Stanford Binet Intelligence Scale-IV* (Thorndike et al., 1986), *Vineland Adaptive Behavior Scale* (Sparrow et al., 1984), cognitive and adaptive measures. Tetreault and Lerman (2010) administered the *Preschool Language Scale, Fourth Edition (PLS-4)* (Zimmerman, Steiner and Pond, 2002) and the *Childhood Autism Rating Scale (CARS)* (Schopler, Reichler and Renner, 1988). Kroeger, Schultz and Newsom (2007) administered the *Gilliam Autism Rating Scale (GARS)* (Gilliam, 1995), completed by the study participants' parents, for the purpose of grouping the participants by functioning level. Cardon and Wilcox (2011) administered the *Vineland Scales of Adaptive Behavior, Second Edition* (Sparrow et al., 1984), a standardized parent interview. Additionally they administered the *Childhood Autism Rating Scale (CARS)* (Schopler et al., 2002) and the *Autism Diagnostic Observation Schedule (ADOS)* (Lord et al., 2001) to confirm the diagnosis of autism for the participants. Finally, Nikopoulos and Keenan (2007) administered the *Childhood Autism Rating Scale (CARS)* and a teacher questionnaire to gather information about the behaviour characteristics of the participants at the beginning of the study.

Second, four studies from the systematic literature review administered assessments that specifically addressed social skills. These assessments were administered pre- and post-intervention. First, Cardon and Wilcox's (2011) study focused on imitation skills. They administered the *Motor Imitation Scale (MIS)* (Stone et al., 1997) pre- and post-treatment to assess gains in imitation skills and also to assess generalization. Second, Corbett's (2003) study looked at the perception of emotion. He administered the following measures pre- and post-intervention: selected slides from the *Pictures of Facial Affect* (Ekman and Friesen, 1976), the *Recognition of Emotion in Speech* (Corbett unpublished), and the *Pantomime Recognition Test* (Duffy et al., 1975) to assess the participant's ability to understand nonverbal pantomime actions. Third, Kroeger, Schultz and Newsom's (2007) study focused on a group-delivered intervention. They administered the assessment of *Basic Language and Learning Skills (ABLLS)* (Partington and Sundberg, 1998), *Group Instruction Cluster*, pre- and post-treatment. Finally, Kleeberger and Mirenda (2010) administered a *Discrete Trial Training (DTT)* pre assessment of 70 imitative actions specific to their study.

Although the use of measurement scales as outcome measures are not necessary in single-subject experimental methodologies, the inclusion of a screening tool pre- and post-

intervention which analyses the changes in the participants' social skills could be beneficial. I believe that this is one of the areas in the current research that could be strengthened. In this regard, the present study attempts to make some contribution towards achieving that goal.

2.4.1.3.6 Research questions

Research questions help a reader understand the focus of the study as well as what the researcher intends to answer, confirm or disprove. Research questions lay an important foundation from which the entire research is anchored to. In the process of this systematic literature review, identifying the research questions involved in the studies was not easy. Of the 23 studies identified only three studies, Cardon and Wilcox (2011), Gena, Couloura and Kymissis (2005), and Hine and Wolery (2006) that clearly laid out their research questions for the reader. In six studies, the research questions could be inferred from the stated purpose of the study (Charlop-Christy, Le and Freeman, 2000; Kleeberger and Mirenda, 2010; Maione and Mirenda, 2006; Nikopoulos and Keenan, 2007; Nikopoulos and Keenan, 2003; and Ozen, Batu and Birkan, 2012). Finally, in two studies research questions could be deduced from the stated hypothesis (Charlop et al., 2010 and Kroeger, Schultz and Newsom, 2007).

2.4.1.3.7 Access to typically developing peers

Interventions using video modelling for individuals with autism have included typically developing peers in the capacity of a peer model. For example, typically developing peers have been videotaped to act as the video model for participants to watch their performance on video and to imitate it (e.g. Corbett, 2003; Gena, Coloura and Kymissis, 2005; Kroeger, Schultz and Newsom, 2007; Reagon, Higbee and Endicott, 2006; Simpson, Lagone and Ayers, 2004). In another capacity, Cardon and Wilcox (2011) involved three typically developing peers, ages 20-24 months, to determine the average number of times typically developing peers imitate during play sessions. This information was used to provide a comparison of the number of times the participants with autism imitated during play sessions to that of their typically developing peers.

Other studies have incorporated typically developing peers during different phases of the intervention. Nikopoulos and Keenan (2007) included one peer during the generalization probe for both of their experiments. Charlop et al. (2010) also included peers during their two generalization probes. Participants in Hine and Wolery's study (2006) had physical

proximity to peers during generalization probes, simply by being physically in the classroom with them while playing at the sensory bin; however, they were not involved in any interactive play with the peers.

Only three studies provided the participants with access to typically developing peers throughout all phases of their intervention. Maione and Mirenda (2006) included two peers during baseline, intervention and follow-up phases in ordinary peer play without providing specific peer training. Reagon, Higbee and Endicott (2006) used a peer, the participant's sibling, throughout the intervention, maintenance and generalization probes. In MacDonald et al.'s (2009) study, the participant with autism was paired with a typically developing peer throughout all phases of the study. These studies provide a much needed component to interventions involving video modelling for individuals with autism. Participants have demonstrated the ability to imitate the social behaviours they viewed on the video. Often the demonstration of their imitation skills occurs in an isolated setting. In contrast, an ideal setting for individuals with autism to demonstrate their imitation of social skills would be in the presence of typically developing peers. This lends itself to expanding the imitation of social skills to interactive play, with socially appropriate peer models. This is an area in the research on video modelling for individuals with autism that appears to be lacking.

2.4.1.3.8 Input from participant, parent and/or teacher

Research in the area of video modelling for individuals with autism can impact the lives of the participants, their parents, their teachers and their educators or clinicians. In order to gauge the social validity of such studies, researchers include a social validity questionnaire or survey. Others ensure that the 'voice' of the participant, parent or teacher—the stakeholders—has been heard during the course of the intervention. Having said that, I would like to discuss the studies identified in the literature review which included input from the stakeholders in their studies.

First, only two studies specifically looked at obtaining input from its participants (Apple, Billingsley and Schwartz, 2005 and Ozen, Batu and Birkan, 2012). For example, Apple, Billingsley and Schwartz (2005) interviewed participants pre- and post-intervention to assess the participant's ability to give compliments and understand their own compliment-giving behaviour in both of their experiments. In their second experiment, participants at the end of the intervention were asked to identify statements which were a

compliment from a set of 10 statements. Similarly, Ozen, Batu and Birkan (2012), asked their participants if they were willing to work with the researchers and what the social benefits of the study were for their lives. The participants were asked these questions before each training session and at end of the study.

Second, only four studies included some form of input from the parents. For example, Cardon and Wilcox (2011) asked parents to complete a survey at the conclusion of the study about the appropriateness of their child's imitation and play skills. Similarly, Boudreau and D'Entremont (2010) also asked parents to fill out a parent satisfaction form at the end of the study. In the study by Kroeger, Schultz and Newsom (2007) a reference to parent satisfaction with the study is made, however, it is unclear how this was obtained (i.e., verbal comments during or after the study, a survey, etc.). Reagon, Higbee and Endicott (2006) included a parent satisfaction survey as well as a sibling satisfaction survey at the completion of the study. The sibling participated in their study as a peer video model and peer during play sessions throughout the study. Finally, Apple, Billingsley and Schwartz (2005) asked parents in both experiments to rate their child's social skills, relationship with peers and compliment-giving skills.

Third, only one study, Sancho, Sidener and Reeve (2010), included the 'voice' of the teacher in the form of a teacher survey. Sixteen teachers from the school completed a survey on whether they would be willing to implement this type of program to teach pretend play to children with autism. However, it is unclear whether or not the teachers completing the surveys were the participants' teachers.

As can be seen from the information gained, although the 'voices' of the participants, parents and teachers have been included in some studies, not one study included the 'voice' from all three stakeholders in the study. This appears to be another gap in the research on video modelling for individuals with autism.

2.4.1.3.9 Current gap in research

This systematic literature review has identified five gaps in the current research on video modelling. First, a limited number of studies have compared intervention packages, such as video modelling compared to live modelling (in-vivo) (Charlop-Christy, Le, and Freeman, 2000; Gena, Couloura, and Kymissis, 2005), and video modelling to video self-modelling (Sherer et al., 2001). However, no studies have compared video interventions

shown from the ‘third-person’ perspective (with ‘other’ or ‘self’ as model) to those shown in the ‘first-person’ perspective (point-of-view videos showing only certain body parts of the model such as the hands, or videos that are from the eye-level perspective without showing the model) (Rayner, Denholm, and Sigafoos, 2009). Second, the inclusion of a screening tool pre- and post-intervention which analyses the changes in the participants’ social skills could strengthen the current literature in this area. Third, there is a need for clearly stated research questions to provide the reader with an understanding of what the researcher intends to answer, confirm and/or disprove in the study. Fourth, only a minimal amount of studies included typically developing peers throughout all phases of the study. The inclusion of typically developing peers is a key component to allow individuals with autism to demonstrate their imitation skills in a natural setting, rather than an isolated one. The fifth and final gap identified in the systematic literature review is the lack of input from all major stakeholders in the research study i.e., the participants, parents and teachers.

2.5 Summary

This chapter provided a brief review of the background for this study followed by a description of the social skills interventions for individuals with autism which have been researched to date. A comprehensive systematic literature review was conducted on video modelling from the first-person perspective and the third-person perspective in relation to the social skills of children with autism. Through this literature review, the five gaps in the current body of research in this area were identified.

The next chapter will present the theoretical framework for the theories that underpin this research. It will also provide an in-depth discussion on the methods for the first experiment in this research, including the research questions, participants, measures, setting, materials, intervention procedures, independent variable, dependent variables, experimental design, and procedures.

Chapter 3. Experiment #1 Methods

3.1 Introduction

The primary aim of this research was to identify whether video modelling or point-of-view video modelling would be more effective in increasing the verbal and action imitation skills of the participants with autism. The secondary aim was to understand how the outcomes of this study could be applied into current classroom interventions for individuals with autism. This chapter will provide a clear picture of how these aims will be addressed through a mixed-methods study conducted at the first of two primary schools in North East England.

The first section of the chapter will provide a theoretical framework for the theories that underpin this research. The second section discusses the selection of the research method this study will depend on. The third section deals with the research questions that are central to this study. The fourth section deals with a detailed description of the mixed-methods study conducted at the first primary school. This will include ethical considerations, the participants, measures, procedures, experimental design and data analysis. The fifth section presents a methodology diagram of the entire research process undertaken.

3.2 Theoretical Framework

In this section, I will examine some theories of knowledge and learning including the psychoanalytical perspective, cognitive perspective, behavioural perspective, social perspective, transactional-developmental perspective, constructivist perspective, positivist perspective and the interpretivist perspective. Unpacking these theories will lend itself to an understanding of the theories which underpin this study.

3.2.1 The Psychoanalytical Perspective

Sigmund Freud, known for his *Psychosexual Theory*, focused on three parts of the personality, the id, ego and superego, and how they inter-relate during five stages of development (Berk, 2009). Freud spoke of the influence of the parent-child relationship in the early years.

Following Freud, Erick Erikson, known for his *Theory of Psychosocial Development*, built his theory on the work of Sigmund Freud. He extended his work to include phases

across the lifespan. Erikson emphasized that development should be understood relative to the situation of each culture (Berk, 2009). He believed that in each stage of development, a crisis arises which must be resolved. It is through the resolving of this crisis, whether it is positive or negative, that one develops socially as well as emotionally (Keenan and Evans, 2009).

3.2.2 ***The Cognitive Perspective***

Cognitivists acknowledge the internal mechanisms of individuals, which are not observable. These include one's beliefs, desires and motivation. Jean Piaget, Lev Vygotsky, Noam Chomsky and Jerome Bruner were all theorists who are linked to the cognitive perspective. For the purposes of this study, I will focus on Piaget and Bruner. I will address Vygotsky's theory under the social perspective section, although he can also be linked to the cognitive perspective.

Jean Piaget's *Cognitive Theory of Development* emphasizes qualitative changes in a person's thinking as they move through four stages of development (Berk, 2009). Piaget's theories in child development is influential due to his emphasis on children being active participants in their own learning. He believed that children actively construct their knowledge and understanding of the world (Berk, 2009). He did not believe that learning is dependent on rewards or reinforcers, as the behavioural theorists emphasize.

Piaget proposed that children create a mental structure (i.e., schema) that helps them understand their environment (Lever-Duffy, McDonald and Izell, n.d.). As new information comes in that fits within existing representations, the child assimilates or incorporates the new information. If the new information does not fit in, then the child creates a new mental structure for it to fit into. As this process takes place, the child continually constructs his understanding of the world. Piaget's theory is linked to cognitive or individual constructivism (i.e., learning that takes place through developmental stages and learning styles) (Powell and Kalina, 2009; Atherton, 2013).

Similarly, Jerome Bruner believed that development is a continuous process, not something that takes place through sequential steps. Bruner proposed three modes of representation (Bruner, 1966). First, enactive or action-based representation, where one learns through actions when words may be inadequate to describe something. The second mode of representation is iconic or image-based, where one learns through visual and

sensory input. And the third mode is symbolic or language-based representation. Bruner further emphasized the importance of instruction followed by an opportunity to practice and experience what was learned. Furthermore, Bruner saw development as a gradual process of moving from cognitive understanding that is child-like to an understanding which is more adult-like (McLeod, 2008).

3.2.3 ***The Behavioural Perspective***

Behaviourists focus on observable and measurable behaviour, rather than internal mechanisms such as an individual's feelings, beliefs and thoughts. Behaviourists believe that behaviour is influenced by an individual's interaction with the environment. Furthermore, they believe that learning can be explained by a stimulus-response relationship. In this case, some well-known behaviourists include Ivan Pavlov, John B. Watson and B. F. Skinner.

John B. Watson, who is known as the father of behaviourism, extended the work of Ivan Pavlov by applying the same principles of *classical conditioning* to children. Watson is known for an experiment he conducted with an eleven-month old infant. In this experiment, after repeated exposure to a neutral stimulus (a soft white rat) coupled with a sharp, loud sound, the infant became scared of the rat. (Berk, 2009; Keenan and Evans, 2009). In light of this, Watson concludes that children's behaviour could be moulded by adults with the careful control of stimulus-response conditions (Berk, 2009; Keenan and Evans, 2009).

B. F. Skinner, who is known for his *Operant Conditioning Theory*, believed that a behaviour could be manipulated in such a way that the behaviour could either be increased or decreased (Berk, 2009). A behaviour could be increased when the behaviour is followed by a reward or reinforcer (i.e. food, praise, access to a preferred item). A behaviour could be decreased when followed by punishment (i.e. removal of privileges). This theory differs from other child development theories in that it does not consider the role of internal thoughts or feelings. Operant conditioning has become a recognized applied learning principle (Berk, 2009; Keenan and Evans, 2009). Skinner is considered as one of the pioneers of Applied Behavior Analysis (ABA). This is a well-recognized therapy for individuals with autism. For an interesting perspective on Skinner's influential role in the development of ABA, see Morris, Smith and Altus (2005).

Ivar Lovaas is well known for his work with children with autism and Applied Behavior Analysis (ABA). He, along with Skinner, is considered to be one of the pioneers of ABA. Applied Behavior Analysis is based on principles of behaviour modification to increase desired behaviours and reduce or eliminate undesired behaviours. The Lovaas Model of Applied Behaviour Analysis was developed to provide early intervention for children with autism. His program initially started under the direction of Lovaas in the UCLA Psychology Department and the UCLA Young Autism Project (The Lovaas Center, n.d.).

3.2.4 ***The Social Perspective***

Lev Vygotsky is known for theories of cognitive development as well as social development. He emphasized the role of language within social interactions in the child's development. Similar to Piaget, Vygotsky believed that children actively explore their environment and play a role in influencing their own knowledge (Keenan and Evans, 2009). He believed that a child's cognitive development happens through social interactions with more experienced members of society, such as parents, family members, teachers and peers (Keenan and Evans, 2009, p.44). He believed that through these social interactions, cognitive processes and skills are transferred socially from the more experienced members of society (Berk, 2009). He viewed cognitive development as a social process (i.e., social constructivism) (Keenan and Evans, 2009; Berk, 2009). Vygotsky believed that development moved through two levels, from the interpersonal level to the intrapersonal level, leading to internalization (Keenan and Evans, 2009). Vygotsky's theory is linked to social constructivism (i.e., knowledge is socially constructed through a cooperative effort) (Atherton, 2013; Powell and Kalina, 2009). In contrast to Piaget's theories, Vygotsky stressed the importance of social interaction on the development of mental constructs. (Lever-Duffy, McDonald and Mizen, n.d.).

Albert Bandura's work sits centrally between the work of behaviourists and cognitivists' approaches to psychology and education (Hilpert, 2012). Bandura, who is also from a behaviourist background, believed that all human behaviour could not be linked only to a stimulus response relationship, as was stipulated by Watson and Pavlov in their classical conditioning theory (Hilpert, 2012). Nor could human behaviour only be explained by a response stimulus or a relationship with rewards, as was stipulated by Skinner with his instrumental conditioning theory (Hilpert, 2012). Bandura believed that children develop by watching and listening to others (i.e. observational learning). This differs from behaviourists such as Skinner in that learning takes place even in the absence of

reinforcement or punishment (Keenan and Evans, 2009). Bandura believed that intrinsic reinforcements such as a sense of accomplishment, satisfaction and pride have an important place in learning. Learning does not only take place through external reinforcement.

Bandura developed the *Social Learning Theory*. In his theory, children learn new behaviours from observing other people. Bandura proposed that observational learning happens through three models: watching other people perform a behaviour (a live model), verbal instruction on how to perform a behaviour and through a real or fictional character that demonstrates the behaviour through the media, a video, etc. (Bandura 1969, 1976). Bandura also proposed four steps in modelling—attention, retention, reproduction and motivation (Bandura, 1971). In order for a learner to learn from a model he must first pay attention to the model. Next, the learner makes some kind of mental representation or image of the model's actions, so that he can later reproduce it. Finally the learner must be motivated to reproduce what was observed.

According to Jonathan Hilpert (2012), a central difference to Bandura's theory is the difference between knowledge and behaviours. By contrast, behaviourists believe that learning can only be observed (i.e., observable and measurable behaviour). For behaviourists, this is the only true representation of learning. However, Bandura states that an individual could learn something but may not demonstrate that learning in something observable. This may be due to the fact that the person did not have an opportunity to demonstrate the behaviour. As Hilpert (2012) further states, "Sometimes we can know things but not always act on them. The difference between knowledge and behaviours is profound" [video clip]. One can also demonstrate behaviours without true knowledge. For example, a child can count by rote without yet having the knowledge of one-to-one correspondence (Hilpert, 2012). With social learning theory, it is important to look at the interaction between the person, the environment the person is situated in, and the behaviours or outcomes (Hilpert, 2012). This is what Bandura refers to as 'reciprocal causation'. In this view, there is a bidirectional component when looking at these relationships. For example, one would look at the relationship between the person and the environment, how the person influences the environment as well as how the environment influences the person. This is also true when looking at the bidirectional relationship between the environment and the behaviours, or the person and the behaviours (Hilpert, 2012).

In Bandura's early work, he identified different factors that affect a child's motivation to imitate in relation to reinforcement and punishment. These factors include the child's history with reinforcement and punishment, the potential for future reinforcement and punishment, and even watching a model receive a reinforcer or punishment (Berk, 2009). Bandura later revised his theory to encompass how children think about themselves and others, which he called a *Social Cognitive Theory*. What a child learns and imitates is influenced by the child's ability to listen to and remember what was observed (Keenan and Evans, 2009). A child also begins to understand general rules of behaviour from what he observes (Berk, 2009). Children start to develop an expectation for behaviour and a sense of, what Bandura refers to as 'self-efficacy', based on watching others praise themselves and even blame themselves (Berk, 2009; also see Bandura 1992, 1999, and 2001). In doing so, children become discriminatory in what they imitate (Berk, 2009).

3.2.5 ***The Transactional-developmental Perspective***

The transactional-developmental perspective is based on the transactional model of child development (Wetherby and Prizant, 2000). This model focuses on how the child, parent and the environment all influence each other. A child's social-emotional development is influenced by the relationships he/she experiences, whether good or bad, since the early stages of development. In this model, there is "a reciprocal, bidirectional influence of the child's social environment, the responsiveness of communicative partners, and the child's own developing communicative competence" (Wetherby and Prizant, 2000, p. 2). For a further understanding of this model, see Arnold Sameroff's Transactional Model of Development in Sameroff (2009).

3.2.6 ***The Constructivist Perspective***

There are different positions within constructivism—cognitive, individual, psychological, social and developmental. The basic tenet of constructivism is that humans create knowledge and meaning from the interaction between their experiences and their ideas. Constructivists believe that humans are active creators of their own knowledge. It is through reflecting on new experiences and reconciling them with previous ideas and experiences that one constructs knowledge and meaning, while at the same time, revising ideas and experiences by choosing which experiences are relevant to one's learning.

*3.2.7 **The Positivist Perspective***

Positivists believe that experimental investigation and observation are the only sources of substantial knowledge. Positivists endeavour to uncover truths, facts, and objective reality and meanings (Gephart, 1999). These are all thought to be independent of people (i.e. an objective world exists) (Ibid.). With this perspective, researchers are looking for correlations and associations among variables (Ibid.). Positivist research looks at natural or social phenomena through a methodical and critical investigation. This may be done through questionnaires, experiments, and documents that are coded quantitatively (Ibid.). They use experimental and quantitative methods to test and verify a hypothesis (Ibid.). They may also use qualitative data to obtain a wider range of information outside of what is measurable. Positivists use statistical criteria and terms such as reliability, validity and quality when evaluating quantitative findings (Ibid.).

*3.2.8 **The Interpretivist Perspective***

Interpretivists believe that reality is socially constructed (Ibid.). Interpretivists endeavour to understand and describe world views (Ibid.). Interpretive research is focused on shared meaning and understanding (Ibid.). As Gephart (1999) states, interpretive researchers often prefer meaning-oriented methods such as interviews, ethnography, case studies, transcripts and conversational data. Collecting such data gives value and importance to the interactions that have taken place in naturally occurring social settings. (Ibid.). Guba and Lincoln (1996) as cited by Gephart (1999) describes interpretivists' "meaning focused research as one that is assessed in terms of *trustworthiness criteria* including credibility, transferability, dependability and confirmability and *authenticity criteria* including fairness and ontological, catalytic and tactical authenticity" (p. 105).

*3.2.9 **Theories which underpin this study***

This study was informed by several theoretical perspectives—social constructivism, behaviourism, cognitivism, interpretivism and positivism. However, for the purpose of this study, I take a holistic approach with respect to how children develop. As an educator of children with special needs for over 15 years, I come from a child development background as well as a behavioural background. Professionally, I have seen the importance of looking at a child's holistic development. In the learning process, one cannot discount the importance of internal factors such as a child's motivation, desires and personal interests. Additionally, outside influences such as peers, rewards, incentives, and even punishments, or aversives all impact how a child develops. Having worked with

many children and adults with autism, who have limited to no language, I am convinced of the importance of looking at observable and measureable behaviours as outcomes of development. Since we live in a social world, we cannot discount the importance of social learning and social construction of learning. It is through being in the social world, that one learns the norms, rules and expectations of behaviours from others.

In light of this, I would like to address how the different theoretical aspects discussed in §3.2 informed the development and structure of this study. First, this study relies heavily on aspects of the *Social Learning Theory* by Albert Bandura (Bandura 1969, 1976). As discussed in §3.2.4, Bandura believed that children develop by watching and listening to others. This is what he referred to as observational learning. He proposed that observational learning happens through three models: watching other people perform a behaviour (a live model), verbal instruction on how to perform a behaviour and through a real or fictional character that demonstrates the behaviour through the media, a video, etc. (Bandura 1969, 1976). This study encompassed two of these models, a live model and a model through video. Additionally, Bandura believed that children learn through observation in the absence of reinforcement and punishment. Following Bandura, this study did not include external variables, such as reinforcement or punishment. This is because, the purpose of this study was to identify the participants' responses solely to the presentation of the video and/or play set materials, in the absence of reinforcement or punishment.

Second, this study was developed on the premise that behaviour should be measureable and observable, i.e. the behaviourist perspective. Additionally, behaviour is influenced by an individual's interaction with the environment which can be explained by a stimulus-response relationship. To show this, all sessions were videotaped to provide observable and audible data which could then be transcribed and later analysed.

Finally, I approached the development of instrumentation, methodology and data analysis based on both an interpretivist and a positivist perspective. As an interpretivist, I was looking for shared meaning through interviews with the teachers and the background information collected on each participant. Moreover, the transcripts of the conversational data that were obtained during naturally occurring social play were also influenced by the interpretivist perspective. As a positivist, the use of a systematic experimental

methodology and analysis, using both quantitative and qualitative data from a variety of sources, were used to answer my research questions.

Having established how these theories influenced the development and structure of this study, what I call *a conceptual framework for supporting children with autism with their social skills development* can now be understood. It is through the implementation of a video modelling intervention which is rooted in the social learning theory, that children with autism can enhance their social skills and potentially experience an increased level of peer acceptance.

Having established the theoretical framework of this study, in the section to follow, I will discuss further how the interpretivist and positivist perspectives influence the research method for this study.

3.3 **Selection of Research Method**

In this section, I will briefly discuss the three research approaches—the quantitative approach, the qualitative approach, and the mixed-methods approach. Next, I will describe which of these approaches was undertaken in this study.

The *quantitative approach* to inquiry uses predetermined instruments, performance data, observational data, experiments, pre- and post-test measures, and closed-ended data (Creswell, 2003). The quantitative researcher primarily uses positivist/or post-positivist assertions for developing knowledge (Ibid.). These include the use of hypothesis, questions and variables, cause and effect thinking and the testing of theories (Ibid.).

On the other hand, a *qualitative approach* uses narratives, ethnographies, case studies, grounded theory studies, and phenomenologies (Ibid.). The qualitative researcher primarily uses constructivist assertions for developing knowledge (Ibid.). These include meanings that are historically and socially constructed and multiple meanings of individual experiences (Ibid., p.18). With this approach, open-ended data is collected so that a theory or pattern is developed (Ibid.).

As Creswell (2003) points out, the *mixed-methods approach* encompasses the best of both quantitative and qualitative approaches. The mixed-methods approach collects both quantitative and qualitative data either sequentially or simultaneously (Ibid.). The benefit

of this, is that both closed-ended data and open-ended data are used to better understand the research problem.

The quantitative, qualitative and mixed-methods research approaches have all been considered for this study's data collection and analysis. Having considered each of these methods, it appears to be beneficial to use both the quantitative and qualitative research methods. By doing so, the results can provide a richer understanding of the research problem. As a result, a mixed-methods approach was used involving a single-subject, multiple-baseline design across three groups of participants and three treatment conditions—video modelling from the third-person perspective, point-of-view video modelling from the first-person perspective and a control group. The research design included baseline, intervention and follow-up probes using three play sets. All sessions were videotaped and transcribed for data analysis. Data was analysed using structured observation, descriptive narrative records and event recording.

As discussed, interventions that address the social skills for individuals with autism can help them progress in their social competence and acceptance by peers. As previously stated, individuals with autism often focus on information they observe that is not relevant or causes them to lose sight of the big picture. This can be due to too much stimuli at one time or a misinterpretation of the important details of a given situation. It may also be attributed to their difficulty understanding the perspective of the model giving the demonstration. This research, which is rooted in Bandura's Social Learning Theory (1969, 1976), will use modelling of play skills in the form of a video presentation filmed from both the first-person perspective and the third-person perspective.

In the following sections, first I will describe the research questions that are at the core of this study. Second, I will describe the ethical considerations, participants, measures and procedures of the first experiment, and third, I will present a methodology diagram of the entire research process.

3.4 **Research Questions**

Based on the gaps identified in the systematic literature review in the previous chapter, the following research questions set the foundation for the implementation of this study.

1. Will video modelling or point-of-view video modelling be more effective in increasing the verbal and action imitation skills of the participants with autism?

2. Will video modelling or point-of-view video modelling result in maintenance of skills at a three-week follow-up?

*3.5 **Method***

The first experiment was conducted at a primary school (School #1) located in North East England. At the time of the study, the school had 123 students enrolled, 95 in the mainstream classrooms and 28 in the autistic unit. This school site had a capacity for 30 students in the autistic unit.

*3.5.1 **Ethical considerations***

Prior to conducting this research project, several ethical considerations were identified. This was especially important as the participants involved in the study were considered vulnerable individuals. These individuals are defined as, "individuals or groups who, due to age, ill-health, infirmity, minority status or their otherwise disempowered position in society may be open to exploitation (whether physical, emotional or psychological)" (Truman, C. et al., n.d.).

As the proposed research would be conducted in a real-life classroom setting, it was important to consider any stigma that might be involved in conducting this project within the classroom setting in which children with autism were enrolled. This is due to the fact that simply by belonging to a group, such as a unit or classroom for children with autism on a school campus, there is an element of vulnerability for the participants. Hence, careful measures needed to be put in place to avoid any negative attention that could be drawn towards the participants (i.e. "raising the profile of the particular people researched, or more subtly, by inadvertently reinforcing social stereotypes about that social group," Truman, C. et al., n.d.). In light of such considerations, measures were taken to ensure that the ethical considerations were thoroughly investigated.

First, informed consent was obtained from both the appropriate school administrator and the parents of the participants. Although it was desirable to obtain consent from the participants themselves, with consideration of the age of the participants and the concern about the ability of the participants with autism to understand the consent process, it was decided that consent from their parents would be obtained instead. The nature of the informed consent will be discussed in § 3.9 and 4.6. In addition to formal written consent, as an ethical researcher, I looked for any cues that the participants might be

demonstrating, such as distress or anxiety involved in participating in the research process. On a daily basis, participants came willingly to the room. Often I would be approached with a smile by the participants and an eagerness to participate. For instance, at the first school where two groups of participants were involved, upon entering the classroom, often participants from the second grouping would try to enter the room for their chance to play. This could be considered as ongoing consent by the participants. If at any time, a participant showed distress, he/she was not brought into the room. For example, on a few occasions, a certain participant was disregulated for an unknown reason. As a result, that participant was not brought into the room for that day's session.

Ethical considerations were also made concerning the mainstream participants as they were brought into a research environment (i.e. in a real-life classroom setting) along with other participants who had autism. In order to avoid any additional stigma involved in bringing the participants into this setting, proper care was taken in considering which mainstream students would be considered for participation in the study (See § 3.5.2.2 and § 4.2.2.2 for the inclusion and exclusion criteria for mainstream participants). At the first school site, the mainstream students were known to the participants with autism as they participated in inclusion activities in their class. However, by selecting students who were familiar to the participants with autism, this would likely reduce or avoid any anxiety variables on the part of the participants with autism had they not known their mainstream counterparts. So, by eliminating this factor, it was anticipated that the students with autism would feel a sense of familiarity or ease while playing with the familiar mainstream students. With this in mind, the research took place in a small room adjacent to the Reception classroom. At the second school site, the research took place in settings outside of the autistic unit. This helped reduce any possible stereotyping or stigmatizing of the participants involved. Although the mainstream participants were not familiar to the participants with autism, measures were taken to identify participants that would be best suited for the role. (See § 4.2.2.3 for a discussion on the limitations in obtaining consent for the participants.)

As part of the informed consent process, all parties involved (e.g. the head teachers, staff, participants and their families) were all informed that participation was voluntary, that consent could be withdrawn at any time for any reason, and that there would be anonymity and confidentiality throughout the research process. Anonymity and confidentiality are essential elements of social research. This is even more necessary

when working with vulnerable individuals (Truman, C. et al., n.d.). (Refer to Appendices N-S for a copy of the cover sheet, information sheet and consent forms provided to all parties involved.)

Finally, as this research involved children, every measure was taken to use 'child friendly' terminology and supports in the sessions (e.g. the scripts for the videos, verbal prompts used in the sessions, and visuals and sign language used). Each of these measures were implemented to also reduce any possible anxiety on the part of the participants, as well as to ensure that the research was not set up in a clinical format as it was conducted in the classroom environment.

In concordance with the university's guidelines, this research project went through a full ethics committee approval process. The Faculty of Humanities and Social Sciences Ethics Committee at Newcastle University positively accepted the application for a full ethical approval of this study. The initial approval was granted on 13 June 2012, with a subsequent approval with revisions made on 23 January 2013.

Taking into consideration the hitherto points, I now turn to the participants, measures and procedures of the second experiment, followed by a diagram of the entire process.

3.5.2 ***Participants***

3.5.2.1 ***Inclusion and exclusion criteria for participants with a diagnosis of autism***

In order to be included in the intervention group, students needed to meet five criteria. First, the student needed to have a diagnosis of Autism or Autism Spectrum Disorder (ASD). Second, the student needed to be in the age range of 3-7 years old. Third, the student needed to be on a mainstream campus with access to mainstream students during the study. Fourth, informed consent needed to be provided in order for the student to be a participant in the study. If students had a diagnosis of Autism or ASD, yet were outside of this age range, they would not be considered a participant. Likewise, if a student did not yet have a diagnosis of Autism or ASD, yet it was suspected, the student would not be considered a participant. And fifth, the student must not display a high number of challenging behaviours that would affect his or her ability to attend to the videos appropriately.

3.5.2.1.1 ***Rationale for the inclusion criteria***

The purpose of this study was to compare the effectiveness of video modelling as a social skills intervention for children with autism. A critical component of the inclusion criteria was for the participants to have an identified diagnosis of Autism or ASD. The reason is two-prong. One has to do with the population that this particular intervention was targeting. The other has to do with the intervention of video modelling that addresses both the strengths as well as the weaknesses of individuals with autism.

3.5.2.2 ***Inclusion and exclusion criteria for mainstream participants***

In order to be included in the study as a mainstream participant, five criteria needed to be met. First, students needed to demonstrate typical development. Second, the students must not have any known diagnosis (i.e., autism, learning disability). Third, the students needed to be enrolled in and attending a mainstream classroom. Forth, informed consent needed to be provided by parents/guardians. And fifth, it was preferred that the students were between the ages of 3-7 years old, to represent peer models of the same age for the study. The first three criteria were considered the most important for this study. If a student was not demonstrating typical development, he/she could not be considered a potential participant. If he/she had any diagnosis that was known, he/she also could not be considered as a participant. If consent was not provided, the student could not be a participant in the study. Finally, if the student did not fall within the age range of 3-7 years old, it would be important to determine whether all measures had been exhausted to find peer role models of the same age before looking outside of this age group.

3.5.2.3 ***Limitations in obtaining consent for participants***

At the initial stages of this intervention, the researcher met with the school's Headteacher and Headteacher in charge of the autistic unit and SENCO, i.e., the Special Educational Needs Co-ordinator. At this meeting, students were identified from the two classes within this age range that would meet the inclusion criteria. Based on this information, the consent forms for the participants with Autism were sent to only these identified students. Information packets were sent home to the six students within the study's age range who were identified. The information packets included a cover letter, an information sheet on the study as well as a consent form. These will be discussed in detail later on in this chapter (see §3.9). Of the six identified potential participants, five parents provided informed consent for their son or daughter to participate in the study (information on informed consent will be discussed later in this chapter in §3.9). One student was unable

to be considered as a participant due to some safeguarding issues. Information packets were also sent home with 17 mainstream students in the identified mainstream class. Of the 17 sent home, only three families provided consent for their child to participate in the study as a peer model.

In real life research, one cannot control who opts in and who opts out of the study. This applies to the school level as well as the participant level. Initially a meeting was held with the appropriate school administrator to discuss the aims of this study. Based on this meeting, a decision was made as to whether or not the administrator was in agreement with the study being conducted at the school. The response was positive on the part of the school administrators. On the participant level, the low number of students with autism at the school site presented a challenge with the potential number of positive replies to the consent form. This was evident in the case of the mainstream students. Several factors could be the reason for such a low response. First, follow through on the part of the teacher. At the initial stage of the study, a brief meeting was held with the teachers from the autistic unit and the mainstream teacher. It is unclear how much the mainstream teacher was invested in supporting the efforts of the researcher in completing this study. In the course of the study at this school site, a teacher change was made in the mainstream classroom. It is unclear whether parents were aware of the change that was to come. Second, although the autistic unit was part of a mainstream school, it was in a separate building on the campus. Although the autistic unit was a part of the school, there appeared to be a feeling of 'segregation' or 'separateness' between the two programs. In fact, on a few occasions, the mainstream students would refer to 'returning to their school' after completing a session, rather than 'returning to their classroom'.

3.5.2.4 ***Participants with a diagnosis of autism***

Five students who were enrolled in the autistic unit of a mainstream school located in North East England participated in the study. Each of the students had a diagnosis of Autism or Autism Spectrum Disorder (ASD). Four of the five participants attended the same class in the autistic unit. The remaining participant attended the class in the room next door to the other participants in the autistic unit. The supports that were provided in their classroom to foster communication and language development included: oral language, Picture Exchange Communication (PECS) books, Makaton signs and symbols and an interactive white board.

To get a better understanding of the participants with autism involved in the study, what follows is a brief description of each participant, their classroom setting, their communication style, social skills, likes, and dislikes. In addition, target goals for the participants from *The SCERTS® Model: A Comprehensive Educational Approach for Children with Autism Spectrum Disorders* (Prizant et al., 2006) are also presented. These goals were incorporated into the participants' instructional program. As this study focuses on imitation skills, a brief description of the participant's ability to imitate has also been included. Please note that the names of all participants have been changed to remain anonymous.

3.5.2.4.1 ***Liam***

Liam was 4 years, 10 months at the time this study began. He was the youngest participant in this experiment. Liam was in Reception in a class of 6 students. In his class there were 5 boys and 1 girl. There was one teacher and two teaching assistants. He spent his school day in the autistic unit. He had integration with a mainstream reception class every Monday, along with his entire class. The setting for the integration alternated each week between the autistic unit and the mainstream classroom. Then each Wednesday, he was involved in an integrated assembly along with his class. His teacher reported that he mainly used single words to communicate and was beginning to put two words together. He used several speech sound substitutions which affected his intelligibility. He tended to react to other people trying to communicate with him rather than initiating communication himself. Socially, he liked solitary play with cars and trains; however, he was beginning to play alongside others for short periods of time. His target goals, based on the SCERTS Social Partner Stage, included: to initiate bids for interaction and to use sequences of gesture or non-verbal means in coordination with a gaze. Other learning objectives included showing a degree of interest in other children's play/activities and observing others engaged in a range of activities. Per teacher report, Liam would imitate familiar words and phrases after one model. He needed extra verbal prompts to imitate less familiar words. He needed his attention directed to motor actions modelled by an adult. He might imitate something if he found it to be purposeful to what he was doing.

3.5.2.4.2 ***Esther***

Esther was 5 years, 0 months at the time this study began. Esther was in Reception in a class of 6 students. In her class, she was the only girl. There was one teacher and two teaching assistants. She spent her school day in the autistic unit. She had integration with

a mainstream reception class every Monday, along with her entire class. The setting for the integration alternated each week between the autistic unit and the mainstream classroom. Then each Wednesday, she was involved in an integrated assembly along with her class. Her teacher reported that she used some eye contact and would babble, echo songs and learned phrases to communicate. She was beginning to use spontaneous speech but would often refuse to verbally communicate. She could lead an adult by the hand and would protest by whining. To show pleasure she would smile broadly or laugh. Socially, she was aware of those around her and was aware when her name was called. She was learning to take turns and was beginning to form friendships. She occupied herself for long periods of time using toys and materials appropriately. She liked a wide variety of toys, books, painting, craft activities as well as the computer. She disliked being told what to do and sitting for long periods of time, unless it was a self-chosen activity. She was working on targets from the SCERTS Social Partner Stage which included engaging in reciprocal interactions, greetings and spontaneously imitating familiar actions or words immediately after a model. Per teacher report, Esther would spontaneously imitate familiar words immediately after a model when directed. She was unlikely to imitate unfamiliar words and might not copy them despite a good amount of adult prompting. She might repeat those hours later either within or out of context. She did make eye contact during models of motor actions but would generally follow her own agenda during play. She might however produce the motor actions at a later time or date.

3.5.2.4.3 ***Joseph***

Joseph was 5 years, 2 months at the time this study began. Joseph was in Reception in a class of 6 students. In his class there were 5 boys and 1 girl. There was one teacher and two teaching assistants. He spent his school day in the autistic unit. He had integration with a mainstream reception class every Monday, along with his entire class. The setting for the integration alternated each week between the autistic unit and the mainstream classroom. Then each Wednesday, he was involved in an integrated assembly along with his class. His teacher reported that he often relied on single words to express his thoughts and ideas. He did occasionally use three to four-word phrases. His language was frequently echolalic. Joseph liked to play on the computer and the iPod. His teacher reported that he liked to have his own way, tell peers what to do, exert social control and wanted to know 'why'. He also looked at his peers very close up. When playing he liked to hold a collection of objects in both of his hands. Socially, he initiated conversations, however, he needed supports to settle into an activity or to make choices. He enjoyed

being around mainstream peers. He used phrases and sentences to communicate. He initiated conversations and maintained conversations. He also asked a lot of questions. When upset, his voice level increased if his needs were not met immediately, he might shout and run off. He would seek to share information with peers and adults. He repeated words to gain a desired outcome from peers. The target goals he was working on from the SCERTS Social Partner Stage included: engaging in reciprocal interactions; being aware of a change in a partner's expression of emotion; using a variety of objects in constructive play; improving his complex motor imitation skills; and imitation from memory. His classroom learning objectives included: observing others engage in a range of activities; and to work, play and engage in an activity alongside others in parallel. Per teacher report, Joseph would immediately imitate familiar and unfamiliar statements when asked to do so. He would attempt to copy motor actions immediately but had difficulty with the physical execution of movements and actions.

3.5.2.4.4 ***David***

David was 5 years, 9 months at the time this study began. David was a Year 1 student in a class of 6. In his class there were 5 boys and 1 girl. There was one teacher and two teaching assistants. He spent his school day in the autistic unit. He had integration with a mainstream reception class every Monday, along with his entire class. The setting for the integration alternated each week between the autistic unit and the mainstream classroom. Then each Wednesday, he was involved in an integrated assembly along with his class. He would often avoid eye contact, make rhythmic noises and make noises to indicate his pleasure or upset. He would take an adults hand to push it toward an object he wanted or would take an adult to the object or area of interest. He would also pull away from unpleasant stimuli. Socially, he was aware of those around him and was learning to take turns. He enjoyed activities that involved musical toys and switch-activated toys. He also liked to spin himself, rotate his hands, run, and swing. He disliked loud noises, aggressive noises and being told what to do. Target areas he was working on in class, based on the SCERTS Social Partner Stage, included imitating familiar actions or sounds when elicited immediately after a model; responding to bids for interaction; and turn taking opportunities. At the time of the study, he was imitating during one-to-one sessions but not frequently. He required hand-over-hand assistance to copy actions out of visual routines. He did imitate some when matched with a verbal prompt. Per teacher report, David did not imitate verbal statements or sounds. He was non-imitative in this regard. He might imitate actions when provided many verbal prompts but not consistently. His

gaze was often away from models if he was not interested or if the objects were unable to be pulled apart or shredded, as this is something he liked to do.

3.5.2.4.5 ***John***

John was 6 years, 7 months at the time this study began. He was the oldest participant in this study from this school. John was a Year 1 student in a class of 6 boys. His classroom was next door to the other participants in the autistic unit. In his class, there was one teacher and two teaching assistants. He spent his school day in the autistic unit. John participated in an integrated assembly once a week with mainstream peers, Additionally, Year 2 mainstream peers joined his class each Friday for 30 minutes per week. His teacher reported that John had begun to communicate with intent, moving from simply using gestures and vocalizations to communicate, to using words to communicate. This moved him into the SCERTS Language Partner Stage. His teacher noted that his voice was often softer than a whisper and she shared that he did require plenty of time to process information as well as to organize his motor planning. His teacher also shared that he also liked to be supported in his play. John liked music and musical toys. He also enjoyed rocking from side to side. He was often seen as 'nosey' as he was aware of what was going on around him and was often amused by others being chastised. He was also seen as mischievous. He also liked to listen to his nails tapping on tables or objects. He did not like getting messy or using a lot of tactile materials. He often would get engrossed in an activity and did not like being told to move on. He also disliked having unfamiliar adults in class. His teacher also noted that it was best to avoid sitting him next to boisterous and unpredictable students. She also stated that it was best to avoid using a loud voice and giving him too much information at a time. Learning objectives he was working on included developing an awareness of sharing an object with another person, and developing some awareness of participation. He had a target, based on the SCERTS Social Partner Stage, to be able to imitate familiar actions immediately after a model. Per teacher report, John could imitate familiar single words occasionally and in context during requests for a desired object or action. She noted that this was greatly reinforced by parents and was a recent development for John. This skill was not consistent and was based on his own terms. He was often very quiet and his spoken voice and the volume were often lower than a whisper. He was non-imitative of unfamiliar words. He would attempt to copy familiar motor actions after a lot of adult prompting and modelling. He did not attempt to imitate unfamiliar motor actions.

3.5.2.5 **Mainstream participants**

In addition to the participants, three mainstream peers from the mainstream Reception class acted as peer models in the videotapes. They were two boys, ages 6 years, one month and 6 years, 4 months and one girl, age 5 years, 5 months. The mainstream peers were present in all sessions of the study, from baseline, to the viewing of the videos, and the play sessions following the video viewings. Per teacher report, the mainstream students were well adjusted, well adapted, sociable children in a class of 17 mainstream students. Their teacher reported that these three participants played well independently and were able to maintain attention to and concentration on tasks that they were working on.

3.6 ***Child measures***

3.6.1 ***Standardized and informal assessments***

A school file review was conducted for each participant with autism. The purpose of this review was to not only verify that each participant had a diagnosis of autism, but also to obtain any information from standardized and informal assessments that had already been administered. See Appendices C-G for the most recent standardized and informal assessments that were obtained for each participant with autism based on the file review. They include the Psychoeducational Profile-Revised (PEP-R) (Schopler et al., 1990) and the SCERTS Profile Summary (Prizant et al., 2006).

3.6.2 ***Social skills checklist***

A *Social Skills Checklis*t was completed by the parents and teachers of the participants with autism at the beginning and at the end of the study. This social skills checklist was included for three reasons. First, it addressed one of the gaps identified in the systematic literature review for this study. Currently, there is a scarcity of studies on social skills interventions in which social skills assessments were administered as part of the study's methodology. Only four studies (Cardon and Wilcox, 2011; Corbett, 2003; Kroeger, Schultz and Newsom, 2007; and Kleeberger and Mirenda, 2010) out of the 23 studies identified in the systematic literature review met this criteria. Second, the social skills checklist would provide this researcher a better understanding of the participants' broad range of social skills. Third, the social skills checklist might provide information about changes in the participants' social skills over the course of the study (i.e., changes in periphery social skills which may or may not be directly linked to this study).

The *Social Skills Checklist* was modified from the September 2007 version by Project DATA at the University of Washington, USA (see Appendix J for a copy of this checklist). The *Social Skills Checklist* can be completed by a teacher or a family member in 20-30 minutes. It has 90 items covering the following four areas: social play and emotional development, emotional regulation, group skills, and communication skills. Each area is broken down further into sub-skills. For example, the 'social play and emotional development' area is broken down into beginning, intermediate and advanced play behaviours. For each skill item, the person completing the checklist was asked to select the best score that represented the child's skill level based on their observations in a variety of situations. The rating scale categories are: 'almost always', 'often', 'sometimes', or 'almost never'. There is also a section on the checklist for comments to be provided for each skill.

The *Social Skills* Checklist was modified in two areas. First the rating scale from the 2004 version of the Project DATA checklist was used rather than the 2007 version. When filling out the form, the person was asked to rank the child's social skills based on this rating scale. The researcher found the rating scale from the 2004 version to be clearer in defining the difference between score levels. For example, the 2004 version provided the categories 'often' and 'sometimes' to separate out either when "The child displays this skill on a few occasions, settings and with a few people" from "The child may demonstrate this skill however they seldom display this skill" respectively. Whereas, the 2007 version only offered consistently/always meeting criteria, inconsistently/sometimes meeting criteria or does not/never meets criteria. Secondly, the checklist was modified by taking out the portion of the checklist for instructors to list priority skills based on the items checked as a priority on the checklist. The column for identifying priority skills remained on the checklist.

3.6.3 ***Participant questionnaire***

At the completion of the study, participants were asked to answer three questions on a *Participant Questionnaire*. The questions were presented in a child-friendly format with a happy face representing the answer 'like' and a sad face representing the answer of 'dislike'. (See Appendix K for a copy of the Participant Questionnaire.) The questionnaire contained the following questions: 1) What do you think about the video?; 2) What do

you think about playing with friends?; and 3) What do you think about playing with the toys?

3.7 **Parent measures**

At the completion of the study, parents were asked to fill out a questionnaire to find out about their child's imitation and play skills. The questionnaire also surveyed whether parents would be interested in further information on video modelling. A 5-point Likert-type rating scale was used for the questionnaire. A score of 1 indicated that the parent strongly disagreed with the statement and a score of 5 indicated that the parent strongly agreed with the statement. (See Appendix L for a copy of the Parent Questionnaire.) The questionnaire contained the following statements: 1) My child's imitation skills have improved over the course of this research study; 2) My child's turn taking skills have improved over the course of this research project; 3) My child's imaginative play skills have improved over the course of this research project; 4) I would be interested in learning how to use video modelling at home; and 5) I would be interested in learning how to use video modelling in the community.

3.8 **Teacher measures**

At the completion of the study, the participants' teacher was asked to fill out a questionnaire to find out about their students' imitation and play skills. The questionnaire also surveyed whether they would be interested in further information on video modelling. A 5-point Likert-type rating scale was used for the questionnaire. A score of 1 indicated that the teacher strongly disagreed with the statement and a score of 5 indicated that the teacher strongly agreed with the statement. (See Appendix M for a copy of the Teacher Questionnaire.) The questionnaire contained the following statements: 1) My students have improved their imitation skills over the course of this research study; 2) My students have improved their turn taking skills over the course of this research project; 3) My students have improved their imaginative play skills over the course of this research project; 4) I would be interested in learning how to use video modelling in my lessons; and 5) I would be interested in learning how to use video modelling to support my students while they are out in the community.

3.9 **Informed consent**

Prior to implementing the experiment at the school, informed consent was obtained from the appropriate school administrator and the parents of all participants. Information sheets

were provided which outlined the background information and qualifications of myself, the researcher, as well as offering access to a copy of my curriculum vitae (CV) and Criminal Records Bureau (CRB) Enhanced Disclosure. (Refer to Appendices N-S for a copy of the cover sheet, information sheet and consent forms.)

3.10 **Groupings**

Through random selection, two groups were formed out of the five participants. Group 1 consisted of David and John. These two participants were from two different classrooms, however, John formerly attended the same class as David and knew him well. Group 2 consisted of Esther, Liam and Joseph. Group 2 participants attended the same classroom. The three mainstream students joined each group throughout all aspects of the research study.

3.11 **Setting**

The setting for all sessions were held within the school that the participants attended, rather than in a contrived clinical type of setting. All sessions at this school were conducted in a small room located within the classroom. During the study, the room contained a short rectangular table at knee-height level. Three chairs were placed on each of the longer sides of the table. An additional chair was seated behind one set of three chairs for the teaching assistant. The room also contained a tripod with a digital camera mounted on it. During the sessions involving viewing of the videos, four additional chairs were added, one containing the laptop for viewing and three facing the laptop. No other items other than the play sets were in the room.

3.12 **Materials**

3.12.1 ***Play sets***

Three play sets were used in the study at School 1, a farm play set, a town play set and a playground play set. The farm included one base, a large Fisher-Price Little People® Animal Sounds Farm™ (with the sound disabled). Animals included a pig, sheep, 3 cows, 1 goat, 6 horses, and an attached rooster. The play set also included a four piece yellow fence, two buckets, a blue wheelbarrow with hay on it, a red wheelbarrow and a tractor. The set included 6 people: a Little People® farmer, the helper, girl, small farmer, main farmer character and a boy. See Figure 1 for a picture of the farm play set.

The town included four buildings: police station, tea shop, post office, toy shop and a telephone booth. It also contained two vehicles: a motor car and motorcycle. It contained 11 people: grandma, grandpa, mum, dad, boy, two girls, baker, toy shop person, police woman, and police man. See Figure 1 for a picture of the town play set.

The fairground included three rides: a swinging ship, a carousel, and a spinning rocket ride. The swinging ship had room for two characters, the carousel contained four horses that could be ridden and the rocket ride could fit two passengers. The following 9 people were included in this play set: grandma, grandpa, mum, dad, boy, two girls, baker, and the toy shop person. See Figure 1 for a picture of the faiground play set.

The farm play set materials were new or novel to the children. They did have a farm set in which they played with on a rotation every six weeks, however, a different farm play set was selected to use in this study. The town and fairground play sets were available at the school site for the children to play with. They accessed these toys on a rotation every six weeks.

Figure 1. Pictures of the three play sets used in the experiment at School 1—the farm play set, the town play set, and the fairground play set.

3.12.1.1 ***Inclusion and exclusion criteria for play sets***

Inclusion criteria for the play sets were based on a thoughtful process. Play sets were considered if they met the following seven inclusion criteria. First, the toys were to be age appropriate. Second, the toys should be gender neutral. Third, they needed to be based on a theme or concept that most children would be familiar with. Fourth, there needed to be enough pieces for the participants to share in their play. Fifth, the toys should have multiple uses, rather than one function only. Sixth, the toys needed to be open-ended,

lending themselves to expand the play. And seventh, the toys should not require instructions to play with. If the toys did not meet any of the above criteria, they were not considered to be used in this study.

3.12.1.1.1 ***Selection of play sets***

Prior to selecting the play sets which would be used in this study, the researcher looked at toy shops in person as well as internet sites for toys for this age range. Additionally, the researcher looked at the play materials available in the classroom. It was important to find play sets that could be shared among five or six children, as this was the size of the intervention groups. The town play set and the fairground play set were ones the students had access to in the classroom. Their teacher noted that they had access to these toys on a rotation schedule every six weeks. The farm play set was new to the students. However, the students did have a farm set that they also had access to on a rotation schedule. The different farm set was chosen as it appeared to provide more extension opportunities as well as more materials to share amongst the participants.

3.13 ***Videos***

In addition to the play sets, four videotapes were created by the researcher. Prior to creating the videos, mainstream children were observed playing with each toy set. These sessions were videotaped for later viewing. Information was gathered from these observations for possible use in the scripts for the videotapes. The researcher developed scripts to be used with the farm and town play sets. The same script created for the farm play set was used for both videotapes filmed from the two different perspectives—the first-person perspective and the third-person perspective. The same script created for the town play set was used for both videotapes filmed from the two different perspectives. No script was developed for the fairground set, as this play set was used in the control sessions without the use of any videotapes. (See Appendices T-W for a copy of the videotape scripts.)

3.13.1 ***Videos from the first-person perspective***

First person relations can be understood by the following model "I → X," where "I" represents the perceiver, "→" represents directional activity, and "X" represents an object (Gomez, 1996, p. 130). When a person is looking at something from the first-person perspective, the person observes an activity directed at an object by the perceiver itself (i.e. the perceiver picks up object X).

Videos which are filmed from the first-person perspective are referred to as point-of-view video modelling. The video is filmed from the eye level perspective of the individual being instructed. It shows a targeted behaviour from the beginning step until the completion. Body parts such as the hands or feet are shown in the video rather than the whole person (i.e. eye level perspective). (Hine and Wolery, 2006; Schreibman et al., 2000).

*3.13.2 **Videos from the third-person perspective***

Third person relations can be understood by the following model "O → X," where "O" is a person different than the perceiver, "→" represents directional activity, and "X" is the object of the other person's activity (Gomez, 1996, p. 130). With this model in mind, when a person is looking at something from the third-person perspective, the person observes another person acting on an object (i.e. person O picks up object X).

Videos filmed from the third-person perspective are referred to as video modelling. The video shows the whole person, whether an adult or child modelling a particular action. Video modelling is described as a process where a person is first asked to watch a video of a peer or adult modelling a target skill, followed by an opportunity to imitate the behaviour (Bellini and Akullian, 2007; Graetz, Mastropieri, and Scruggs, 2006; Sigafoos, O'Reilly, and de la Cruz, 2007).

*3.13.3 **Filming of videos***

The videos were filmed in the same small room that the study took place. In the videos, the three mainstream students, two boys and one girl, acted out the scripts that were created for the farm and town play sets. During the taping of the videotapes, the researcher coached the mainstream children in stating the verbalizations from the scripts as well as the actions. The scripts required the model to act as a particular character by holding it, manipulating it, and speaking for it.

Two videotapes were created using the farm play set. One video was filmed from the first-person perspective (point-of-view video modelling), which was one minute, fifty seconds in length. The other video was filmed from the third-person perspective (video modelling), which was one minute, twenty-nine seconds in length. Two videotapes were also created using the town play set. One video was filmed from the first-person

perspective (point-of-view video modelling), which was one minute, fifty three seconds in length. The other video was filmed from the third-person perspective (video modelling), which was one minute, fifty two seconds in length. No video was created for the fairground set, as this was used in the control sessions.

While taping the videotape from the first-person perspective (point of view modelling), the three mainstream students were seated on one side of a long rectangular table with the toys in front of them. This same format was used for the video filmed from the first-person perspective using the farm play set and the town play set. The video camera was held just above the head of the mainstream participant seated in the middle. Every measure was taken to film from the shoulder height in between the mainstream peers when possible. However, several scenes involved two if not all of the models. In order to capture all of the actions at the same time, filming just above the head of the mainstream participant seated in the middle was required. This still allowed for their hands and arms to be seen in the actions. On a few occasions, when a child leaned in to perform an action, the back of their head or the side profile of their head could be seen on the screen. This still provided a point of view perspective as it was the peer to the left or the right of the participant seated in the middle who was performing the actions.

For the taping of the videotapes filmed from the third-person perspective (video modelling), the mainstream participants could be completely seen in the video. For the video using the farm set, two mainstream participants were seated on the left of the screen facing the rectangular table, with one peer seated on the right of the screen facing the rectangular table. The farm set and toys were placed on the table in front of them. For the other video using the town play set, filmed from the third-person perspective, all three mainstream participants were seated along one of the longer sides of the rectangular table with the toys in front of them. This allowed for a better view of the five buildings and other toy materials included in this set.

3.14 ***Independent and dependent measures***

3.14.1 ***Independent variable***

The independent variable was the presentation of the videotapes prior to the play sessions. The presentation of the videos were presented in a different order to the different groups. One group viewed the video filmed from the third-person perspective for the first play

set, while the second group viewed the video filmed from the first-person perspective. This order was then reversed for the video involving the second play set.

3.14.1.1 ***Dependent measures***

All sessions (baseline, intervention and probes) were videotaped and later transcribed for future analysis. Data were scored from these videotapes on the occurrence of the following responses: (a) scripted verbalizations, (b) unscripted verbalizations, (c) scripted play actions, and (d) unscripted play actions. Operational Definitions are provided in the table below (Table 2).

Table 2. Operational Definitions for Dependent Measures

Operational Definitions for Dependent Measures	
Term	**Definition**
Scripted verbalizations	Verbalizations that matched the script of the model. In addition, statements that were similar to the modelled response but not identical were also scored. This included a substitution or omission of a word. (MacDonald et al., 2009).
Unscripted verbalizations	Verbalizations that were not modelled in the videotape but were appropriate to the context of play (MacDonald et al., 2009).
Scripted play actions	Motor actions that matched the actions of the video model and the same change to the environment occurred. (MacDonald et al., 2009).
Unscripted play actions	Play action that was not modelled in the video but was appropriate to the context of the play. (MacDonald et al., 2009).

3.15 ***Experimental design***

The research process involved both quantitative and qualitative methods. A single-subject, multiple-baseline design across participants (N=5) and three treatment conditions (video modelling from the third-person perspective, point-of-view video modelling from the first-person perspective and a control group) was implemented. The following will describe the procedure used in the experimental design: pre-intervention, baseline, intervention, post-intervention, and follow-up probes.

3.15.1 ***Pre-intervention***

A *Social Skills Checklist* was completed at the beginning of the intervention for all participants with autism in the study. This checklist has been modified from the September 2007 version by Project DATA at the University of Washington, USA. (See Appendix J for a copy of this checklist). The checklist was filled out by the parents of each participant with autism as well as their teacher.

3.15.2 ***Baseline***

Prior to the participants entering the room, the table and chairs were set up. Three chairs were placed facing the rectangular table on each of the longer sides of the table. The play set materials were placed centrally on the rectangular table. Once the participants entered the room and were seated around the rectangular table, they were provided with a visual and verbal prompt. The visual prompt was in the form of a picture of each play set. For example, as the researcher stated "First, we're going to play with farm" the picture was pointed to. Followed by "Then play with town" while pointing to the picture of the town play set. And finally, "Then play with fairground" as the picture of the fairground play set was pointed to. Prior to beginning play with the first play set, a timer was set and then the participants were prompted, "It's time to play." The participants were then give four minutes to play with the toys. The experimenter stood at one end of the rectangular table next to the tripod. All baselines sessions were videotaped for later transcribing and analysing. The teaching assistant was seated behind one row of three chairs. The three mainstream participants were in the room playing alongside the participants with autism.

3.15.3 ***Intervention***

During intervention sessions, the participants with autism were prompted to sit in front of a laptop. The visual schedule was modified with the addition of a picture of the laptop. The participants were prompted, "First, we're going to watch a movie, then play farm. Then we are going to play town and fairground." The video was then started with a prompt, "Let's watch." If a participant looked away from the video while it was presented, he/she was prompted visually to look at the video. If needed, a verbal prompt was added. Following the video, the children were then directed to the table to play with the materials. As in baseline, the participants were given four minutes to play with the toys. The experimenter stood at one end of the rectangular table next to the tripod. All intervention sessions were videotaped for later transcribing and analysing. The teaching

assistant was seated behind one row of three chairs. The three mainstream participants were in the room playing alongside the participants with autism.

With the farm play set, Group 1 was presented with the video filmed from the third person perspective, while Group 2 was presented with the video filmed from the point-of-view perspective. With the town play set, Group 2 was presented with the video filmed from the third person perspective, while Group 1 was presented with the video filmed from the point-of-view perspective.

3.15.4 ***Control Group***

During the control group phase involving the third play set, just as in the baseline phase, a timer was set and the participants were prompted, "It's time to play." The participants were then give four minutes to play with the toys. The experimenter stood at one end of the rectangular table next to the tripod. All control group sessions were videotaped for later transcribing and analysing. The three mainstream participants were in the room playing alongside the participants with autism. Throughout this phase, the participants were not presented with any video as in the intervention phase. As this play set did not have a video presentation, a script was not developed. However, a list of functional play actions for this play set was created. This will be discussed in the results chapter (§5.2.3 and §5.3.3).

3.15.5 ***Post-intervention***

Another *Social Skills Checklist*, as in pre-intervention, was completed at the end of the intervention for all participants with autism in the study. The checklist was filled out by the parents of each participant with autism as well as their teacher. Additionally, questionnaires were completed by the participants with autism, their parents and their teachers. (See Appendices K-M for a copy of the Participant, Parent and Teacher Questionnaires).

Typically two types of instruments are used to assess social skills, norm-referenced tests and informal assessments (Volkmar et al., 2014). The Social Skills Checklist is an informal assessment instrument. It is not a norm-referenced test that rates a person's social skills based on a normative sample. As such, it can be used to provide a further understanding of the participants' social skills strengths as well as their challenges. Additionally, it can provide information which can guide a social skills intervention.

Informal assessments can also be used pre- and post-treatment to measure treatment effectiveness (Volkmar et al., 2014). The purpose of using The Social Skills Checklist was twofold. First, I believe that including a social skills screening tool pre- and post-intervention could strengthen the literature in this area (see §2.4.1.4). Second, by using this tool I hoped to understand whether there would be a periphery change the participants' social skills which may or may not be directly linked to this study. In light of the fact that the Social Skills Checklist was not used as an outcome measure, the administration of the checklist post-treatment after such a short period of time from the first administration was appropriate.

3.15.6 ***Follow-up probes***

Three weeks following the completion of the study, a one-time follow-up probe was conducted. In this probe, the videotapes were not presented. The participants were presented with the play sets and the same visual and verbal prompts as in baseline. As in previous sessions, the participants were given four minutes to play with the toys. The experimenter stood at one end of the rectangular table next to the tripod. The follow-up probe session was videotaped for later transcribing and analysing. The teaching assistant was seated behind one row of three chairs. The three mainstream participants were in the room playing alongside the participants with autism.

3.16 ***Data Analysis***

The holistic theoretical approach to this study influenced the amount of data collected. The data was collected from a variety of sources to provide an in-depth understanding of the research problem. Due to the multifaceted nature and volume of the data collected in this study, it would be helpful to look at the types of data collected.

The following lists the data collected in this study:

- Teacher interview
- Review of educational records and assessments for each participant in the study.
- Videotapes from all sessions (baseline, intervention and follow-up), across three treatment conditions (video modelling from the third-person perspective, point-of-view video modelling from the first-person perspective, and a control group).
- Transcriptions of all videotaped sessions (see above).
- Scripted and unscripted play behaviours of each participant for each play set visually displayed in the form of graphs.

- *Social Skills Checklist*, pre- and post-intervention, completed by the participants' parents and teachers.
- Questionnaires post-intervention from participants, teachers and parents.

Data from descriptive narrative records was analysed using event recording. The following table (Table 3) presents the phases involved in the data trail.

Table 3. Phases of the data trail.

1st Phase	• Educational Records and teacher interviews reviewed for relevance to participants' background information.
2nd Phase	• Videotaped sessions were viewed and transcribed verbatim for each participant. The participants' actions and verbalizations were recorded methodically.
3rd Phase	• Actions and verbalizations for the VM and POVM transcripts were coded based on operational definitions criteria. • Spreadsheets were created for each participant, for each VM and POVM condition. • Functional play actions for the control group conditions were identified. • Functional play actions from the control group transcripts were coded based on established criteria.
4th Phase	• Scripted and unscripted play behaviours identified in the above phase were visually displayed in graphs for both the VM and POVM conditions. • Functional play actions identified for the control group in the above phase were visually displayed in graphs.
5th Phase	• Completed social skills checklists were reviewed. Data was generated and presented in a table format to identify any changes in participants' behaviour post-intervention. • Completed questionnaires were reviewed. Data was generated and presented in a table format to include input from participants, teachers, and parents.
6th Phase	• Graphs displaying the scripted and unscripted play behaviours were visually analysed. • All data combined was analysed and presented using a mixed-methods approach.

3.16.1 ***Reliability***

Every attempt has been made to clearly articulate the steps of the methodology employed in this study in order to allow for future replication. If other researchers are able to perform the same experiment as outlined in this study, using the same conditions and generating similar results would speak to the reliability of this study (Rudestam and Newton, 2007). Reliability in the form of interobserver agreement will be discussed further in the results chapters (5 and 6, §5.4 and 6.3 respectively).

3.16.2 ***Internal Validity***

Internal validity in research refers to how well the study was conducted and whether the independent variable could be identified as the change agent for the dependent variable. Factors implemented to control internal validity in this study included random selection of participants (see §3.10), consistency in implementation of the experimental design during both experiments (see §3.15 and §4.12) and the use of a control group (see §3.15.4). Additionally, internal validity has been ensured by videotaping all sessions, across groups and treatment conditions. This included the videotaping of the participants while they viewed the video presentation. In doing so, data could be compared from what was observed to what was recorded.

3.16.3 ***External Validity***

External validity in research refers to how well the results of the study can be generalized. One possible threat to external validity is that of order effects. Order effects is a change in the participants' behaviour due to the order in which the treatment conditions are presented. Order effects is attributable to practice and even fatigue (McLeod, 2007; Cozby, 2009). For example, having learned something already in the first condition, participants may know what to do in the second condition. This is known as practice effect. With fatigue effect, participants may become tired of the condition and may perform worse than in the first condition. In order to reduce the possibility of order effects within groups in this study, counterbalancing of order treatments was implemented (see §3.15.3 and §4.12.3) (McLeod, 2007). By this, I mean that each group of participants was presented with a different order of treatment conditions. For example, one group viewed the video filmed from the third-person perspective, while the second group viewed the video filmed from the first-person perspective for the same play set.

Finally, to help improve the likelihood that this study could be generalized and replicated, necessary care was taken in clearly describing the participants and each of the steps involved in this study's methodology.

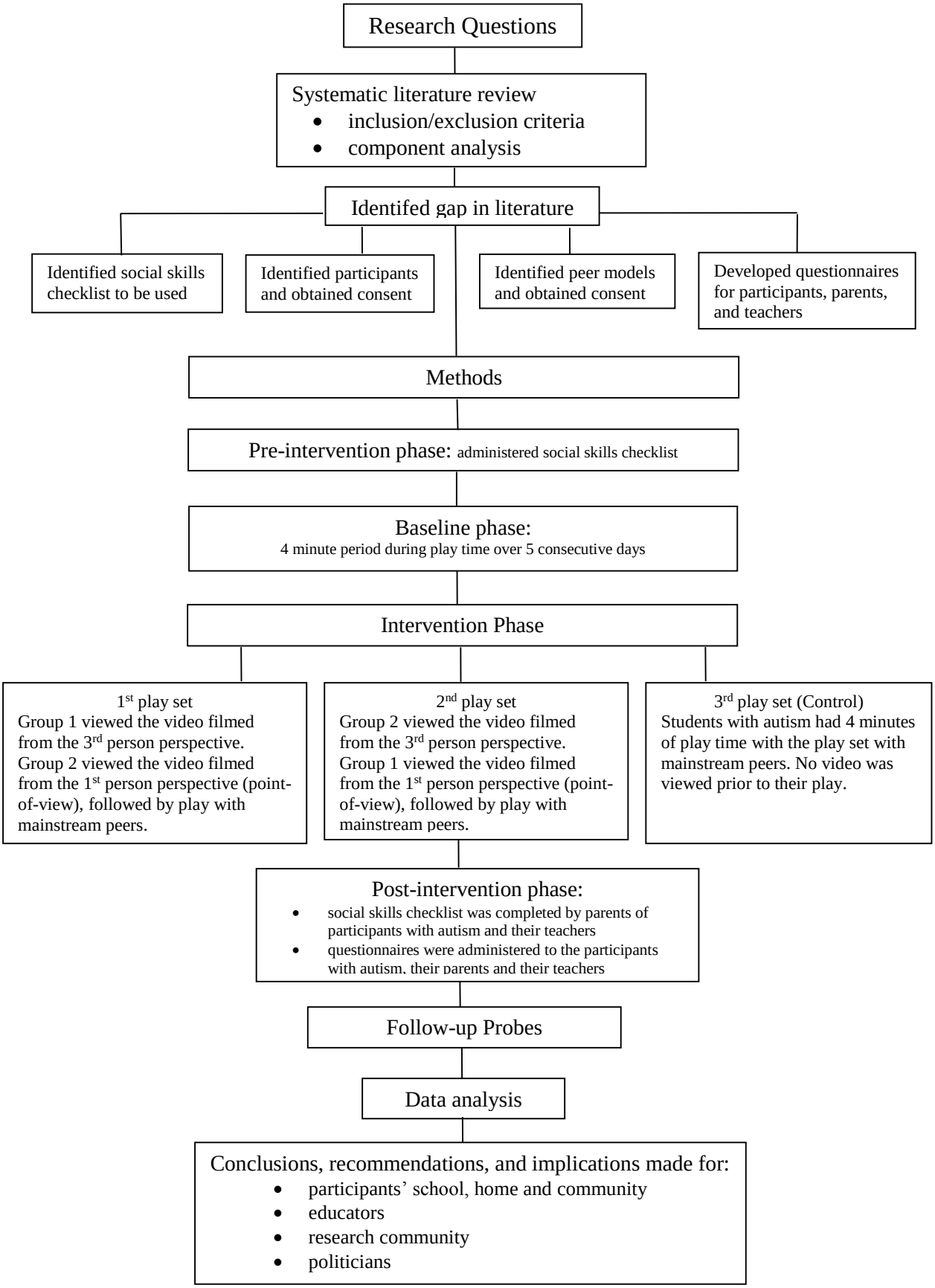
3.17 ***Methodology diagram***

The following page provides a methodology diagram for an overview of the steps involved in the implementation of this study. (See Figure 2.)

3.18 **Summary**

This chapter has provided the theoretical framework for the theories that underpin this research—social constructivism, behaviourism, cognitivism, interpretivism and positivism. The chapter provided an in-depth discussion on the methods for the first experiment in this research, including the selection of the research method, ethical considerations, participants, measures, procedures, experimental design and data analysis. It also provided a methodology diagram of the entire research process. The next chapter will provide an in-depth discussion of the second experiment in this study, including the research method, ethical considerations, participants, measures, procedures, experimental design and data analysis.

Figure 2. Methodology Diagram for Experiment #1



Chapter 4. Experiment #2 Methods

4.1 Introduction

A second experiment was conducted in order to provide additional data in addition to the first experiment. From the outset of this investigation, there was difficulty in locating mainstream schools within the north east of England which enrolled students with autism within the age range of this study. As a result, only five participants were located at the first school site. Due to the small number of participants, additional inclusion and exclusion criteria such as cognitive and language ability could not be considered. It was hoped that the second experiment would provide additional support from additional participants for this particular research.

This chapter will provide a clear picture of how the aims of the study, as outlined in chapter 1, will be addressed through the mixed-methods study conducted at the second of two primary schools in North East England. The first section of the chapter will provide the ethical considerations involved in this study. The second section will clearly describe the participants, measures and the procedures of the first experiment, followed by a diagram of the process.

First, I would like to take a look at the ethical considerations of this study.

4.2 Method

The second experiment was conducted at a primary school (School #2) also located in North East England. At the time of the study, the second school had 270 students enrolled, 264 in the mainstream classrooms and 6 in the communication centre for children with autism spectrum disorder.

*4.2.1 **Ethical considerations***

As with the first experiment of this study, several ethical considerations were identified prior to conducting this research project. This was especially important as the participants involved in the study were considered vulnerable individuals. These individuals are defined as, “individuals or groups who, due to age, ill-health, infirmity, minority status or their otherwise disempowered position in society may be open to exploitation (whether physical, emotional or psychological)” (Truman, C. et al., n.d.).

As the proposed research would be conducted in a real-life classroom setting, it was important to consider any stigma that might be involved in conducting this project within the classroom setting in which children with autism were enrolled. This is due to the fact that simply by belonging to a group, such as a unit or classroom for children with autism on a school campus, there is an element of vulnerability for the participants. Hence, careful measures needed to be put in place to avoid any negative attention that could be drawn towards the participants (i.e. "raising the profile of the particular people researched, or more subtly, by inadvertently reinforcing social stereotypes about that social group," Truman, C. et al., n.d.). In light of such considerations, measures were taken to ensure that the ethical considerations were thoroughly investigated.

First, informed consent was obtained from both the appropriate school administrator and the parents of the participants. Although it was desirable to obtain consent from the participants themselves, with consideration of the age of the participants and the concern about the ability of the participants with autism to understand the consent process, it was decided that consent from their parents would be obtained instead. The nature of the informed consent will be discussed in §4.6. In addition to formal written consent, as an ethical researcher, I looked for any cues that the participants might be demonstrating, such as distress or anxiety involved in participating in the research process. On a daily basis, participants came willingly to the room. Often I would be approached with a smile by the participants and an eagerness to participate. For instance, at the first school where two groups of participants were involved, upon entering the classroom, often participants from the second grouping would try to enter the room for their chance to play. This could be considered as ongoing consent by the participants. If at any time, a participant showed distress, he/she was not brought into the room. For example, on a few occasions, a certain participant was disregulated for an unknown reason. As a result, that participant was not brought into the room for that day's session.

Ethical considerations were also made concerning the mainstream participants as they were brought into a research environment (i.e. in a real-life classroom setting) along with other participants who had autism. In order to avoid any additional stigma involved in bringing the participants into this setting, proper care was taken in considering which mainstream students would be considered for participation in the study (See §4.2.2.2 for the inclusion and exclusion criteria for mainstream participants). At the first school site, the mainstream students were known to the participants with autism as they participated

in inclusion activities in their class. However, by selecting students who were familiar to the participants with autism, this would likely reduce or avoid any anxiety variables on the part of the participants with autism had they not known their mainstream counterparts. So, by eliminating this factor, it was anticipated that the students with autism would feel a sense of familiarity or ease while playing with the familiar mainstream students. With this in mind, the research took place in a small room adjacent to the Reception classroom. At the second school site, the research took place in settings outside of the autistic unit. This helped reduce any possible stereotyping or stigmatizing of the participants involved. Although the mainstream participants were not familiar to the participants with autism, measures were taken to identify participants that would be best suited for the role. (See §4.2.2.3 for a discussion on the limitations in obtaining consent for the participants.)

As part of the informed consent process, all parties involved (e.g. the head teachers, staff, participants and their families) were all informed that participation was voluntary, that consent could be withdrawn at any time for any reason, and that there would be anonymity and confidentiality throughout the research process. Anonymity and confidentiality are essential elements of social research. This is even more necessary when working with vulnerable individuals (Truman, C. et al., n.d.). (Refer to Appendices N-S for a copy of the cover sheet, information sheet and consent forms provided to all parties involved.)

Finally, as this research involved children, every measure was taken to use 'child friendly' terminology and supports in the sessions (e.g. the scripts for the videos, verbal prompts used in the sessions, and visuals and sign language used). Each of these measures were implemented to also reduce any possible anxiety on the part of the participants, as well as to ensure that the research was not set up in a clinical format as it was conducted in the classroom environment.

As discussed in the ethical considerations of the first experiment of this study, in concordance with the university's guidelines, this research project went through a full ethics committee approval process. The Faculty of Humanities and Social Sciences Ethics Committee at Newcastle University positively accepted the application for a full ethical approval of this study. The initial approval was granted on 13 June 2012, with a subsequent approval with revisions made on 23 January 2013.

Taking into consideration the hitherto points, I now turn to the participants, measures and procedures of the second experiment, followed by a diagram of the entire process.

4.2.2 ***Participants***

4.2.2.1 Inclusion and exclusion criteria for participants with a diagnosis of autism

In order to be included in the intervention group, students must meet the same five criteria as in Experiment #1 (§3.5.2.1.1). First, the student needed to have a diagnosis of Autism or Autism Spectrum Disorder (ASD). Second, the student needed to be in the age range of 3-7 years old. Third, the student needed to be on a mainstream campus with access to mainstream students during the study. Fourth, informed consent needed to be provided in order for the student to be a participant in the study. If students had a diagnosis of Autism or ASD, yet were outside of this age range, they would not be considered a participant. Likewise, if a student did not yet have a diagnosis of Autism or Autism Spectrum Disorder, yet it was suspected, the student would not be considered a participant. And fifth, the student must not display a high number of challenging behaviours that would affect his or her ability to attend to the videos appropriately.

4.2.2.1.1 Rationale for the inclusion criteria

The purpose of this study was to compare the effectiveness of video modelling as a social skills intervention for children with autism. A critical component of the inclusion criteria was for the participants to have an identified diagnosis of Autism or ASD. The reason is two-prong. One has to do with the population that this particular intervention was targeting. The other has to do with the intervention of video modelling that addresses both the strengths as well as the weaknesses of individuals with autism.

4.2.2.2 Inclusion and exclusion criteria for mainstream participants

In order to be included in the study as a mainstream participant, five criteria needed to be met. First, students needed to demonstrate typical development. Second, the students must not have any known diagnosis (i.e., autism, learning disability). Third, the students needed to be enrolled in and attending a mainstream classroom. Forth, informed consent needed to be provided by parents/guardians. And fifth, it was preferred that the students were between the ages of 3-7 years old, to represent peer models of the same age for the study. The first three criteria were considered the most important for this study. If a student was not demonstrating typical development, he/she could not be considered a

potential participant. If he/she had any diagnosis that was known, he/she also could not be considered as a participant. If consent was not provided by a parent/guardian, the student could not be a participant in the study. Finally, if the student did not fall within the age range of 3-7 years old, it would be important to determine whether all measures had been exhausted to find peer role models of the same age before looking outside of this age group.

4.2.2.3 Limitations in obtaining consent for participants

At the initial stages of this intervention, the researcher met with the school's Deputy Headteacher. At this meeting, students were identified from the communication centre class on campus. Based on the inclusion criteria, two students would be eligible to be participants. The Deputy Headteacher contacted the parents of the two students to personally explain the aims of the study. Information packets were sent home to the two students identified. The information packets included a cover letter, an information sheet on the study as well as a consent form. These will be discussed in further detail later on in this chapter (see §4.6). Parents of both students provided informed consent for their sons to participate in the study (information on informed consent will be discussed later in this chapter in §4.6). Additionally, the Deputy Headteacher considered the inclusion criteria for the mainstream participants. She identified two students whom she believed would be a good match for the aims of the study. The students were both in Year 5. The grade level of the students was determined by the Deputy Headteacher based on availability for participation for the duration of the study, while keeping in mind the school's testing window. In consultation with their classroom teachers, it was confirmed that these two students would make good peer role models for the participants with autism in the study. Information packets were sent home with the two mainstream students. Although the two students were outside the preferred age range of 3-7 years old, they were considered to be a good match for the participants based on their social skills and maturity level. Additionally, in order to have mainstream students as participants for all phases of the study, students from Year 5 were the only option, based on the testing window for the school.

In real life research, one cannot control who opts in and who opts out of the study. This applies to the school level as well as the participant level. Initially a meeting was held with the appropriate school administrator to discuss the aims of this study. Based on this meeting, a decision was made as to whether or not the administrator was in agreement

with the study being conducted at the school. The school administrator was in agreement with the study being conducted at this school site. On the participant level, the low number of students with autism at the school site presented a challenge with the potential number of positive replies to the consent form.

4.2.2.4 Participants with a diagnosis of autism

Two students who were enrolled in the communication centre for children with autism spectrum disorders in a mainstream school located in North East England participated in the study. Each of the two participants had a diagnosis of Autism or Autism Spectrum Disorder (ASD). They were enrolled in a class of six children, with one teacher and two learning assistants. The children enrolled in the class were in Years 1-6, with one student in each year with the exception of Year 6, which had two students. The supports that were provided in their classroom to foster communication and language development included oral language, Makaton signs and symbols, visual schedules, 'working towards' charts, and an interactive white board.

To get a better understanding of the participants with autism involved in the study, what follows is a brief description of each participant, their communication style, social skills, likes, and dislikes. As this study focuses on imitation skills, a brief description of the participant's ability to imitate has also been included. Please note that the names of all participants have been changed to remain anonymous.

4.2.2.4.1 Eli

Eli was 6 years, 3 months at the time this study began. He was the younger of the two participants with a diagnosis of autism. He was in Year 1 at the time of the study. He had attended this school for two years. He received received speech and language services at school. He did not yet participate in mainstream opportunities. However, he was to begin inclusion opportunities halfway through the experiment. His teacher reported that Eli tended to play with Zac, the other participant in class. During outdoor play time, he and Zac tended to follow each other around.

Per teacher report, his speech was coming along well. He was learning English as a second language. He could communicate his needs verbally. He was a lot more vocal and confident in asking for help and answering questions. He was polite and well-mannered, using 'please' and 'thank you'. He handled transitions well when he was shown a 'now'

and ‘next’ card and his time was counted down. Socially, Eli tended to play alongside other children in the class. He enjoyed computer and sand. During playtime he wanted to and tried to get involved with others but he didn’t have the social skills to start a conversation or to understand what others were playing. Other children had started to try and play with Eli (such as helping him build a model). At times he didn’t understand that they were trying to help him and he would shout out. During a class group game, he needed constant prompting to stay on task and to join in. He enjoyed playing with a Disney Monopoly game in class. Otherwise, he did not play with toys in class. In regards to imitation, per teacher report, he would repeat familiar statements after only a few times. He needed a few prompts to imitate unfamiliar verbal statements.

4.2.2.4.2 Zac

Zac was 7 years, 5 months at the time this study began. He had inclusion opportunities for swimming and physical education twice a week. He was in Year 3 at the time of the study. He had attended this school for two years. He received speech and language services and some Occupational Therapy services at school. His teacher reported that Zac tended to play with Eli, the other participant in class. During outdoor play time, he and Eli tended to follow each other around.

His teacher also reported that Zac liked music, the interactive whiteboard and books. He verbally communicated what he wanted. Socially he was becoming more confident in standing up for himself and he was no longer ordered about by other children. During break and lunch he would play on his own or alongside other children but would not initiate conversations with them. He did not play with toys in class. A recent psychologist report noted that Zac preferred to play alone and he did not regularly engage with other children in class. A recent speech report noted that Zac demonstrated a greater awareness of his peers. He would copy peer’s behaviour in order to get attention from another peer. However, during group sessions, he would allow his peers to make all of the decisions and was a passive group participant. In regards to imitation, per teacher report, he would repeat familiar statements after only a few times. He needed a few prompts to imitate unfamiliar verbal statements.

4.2.2.5 Mainstream participants

Two mainstream students acted as peer models for the videos. The mainstream peers were also present in all sessions of the study, from baseline, to the viewing of the videos, and

the play sessions following the video viewings. The mainstream students were selected by the Deputy Headteacher with consultation from the teaching staff. Both students were male and were enrolled in Year 5, ages 10 years, 3 months and 9 years, 11 months. Per Deputy Headteacher report, the students were described as conscientious and committed. It was noted that they would be able to fulfil the role with confidence and would be able to respond to any guidance if needed. Both students were liked and respected by their peers. They tended to get along with their peers. They played cooperatively and could share. The Deputy Headteacher also pointed out that neither student had a history of any concerns regarding behaviour. She also noted that these two students showed patience with younger children.

4.3 Child measures

4.3.1 ***Standardized and informal assessments***

A school review was conducted for each participant with autism. The purpose of this review was to not only verify that each participant had a diagnosis of autism, but also to obtain any information from standardized and informal assessments that had already been administered. See Appendices H-I for the most recent standardized assessments that were obtained for each participant with autism based on the file review. They represent their PIVATS level equivalent for English and Maths. PIVATS (Performance Indicators for Value Added Target Setting) (Lancashire County Council, 2007) is a system in which targets can be set for students who may be performing outside the national expectations. It is appropriate for use with students with special education needs, such as the participants in this study.

4.3.2 ***Social skills checklist***

A *Social Skills Checkli*st was completed by the parents and teachers of the participants with autism at the beginning and at the end of the study. This social skills checklist was included for three reasons. First, it addressed one of the gaps identified in the systematic literature review for this study. Currently, there is a scarcity of studies on social skills interventions in which social skills assessments were administered as part of the study's methodology. Only four studies (Cardon and Wilcox, 2011; Corbett, 2003; Kroeger, Schultz and Newsom, 2007; and Kleeberger and Mirenda, 2010) out of the 23 studies identified in the systematic literview review met this criteria. Second, the social skills checklist would provide this researcher a better understanding of the participants' broad

range of social skills. Third, the social skills checklist might provide information about changes in the participants' social skills over the course of the study (i.e., changes in periphery social skills which may or may not be directly linked to this study).

The *Social Skills Checklist* was modified from the September 2007 version by Project DATA at the University of Washington, USA (see appendix J for a copy of this checklist). The *Social Skills Checklist* can be completed by a teacher or a family member in 20-30 minutes. It has 90 items covering the following four areas: social play and emotional development, emotional regulation, group skills, and communication skills. Each area is broken down further into sub-skills. For example, the 'social play and emotional development' area is broken down into beginning, intermediate and advanced play behaviours. For each skill item, the person completing the checklist was asked to select the best score that represented the child's skill level based on their observations in a variety of situations. The rating scale categories are: 'almost always', 'often', 'sometimes', or 'almost never'. There is also a section on the checklist for comments to be provided for each skill.

The *Social Skills* Checklist was modified in two areas. First the rating scale from the 2004 version of the Project DATA checklist was used rather than the 2007 version. When filling out the form, the person was asked to rank the child's social skills based on this rating scale. The researcher found the rating scale from the 2004 version to be clearer in defining the difference between score levels. For example, the 2004 version provided the categories 'often' and 'sometimes' to separate out either when "The child displays this skill on a few occasions, settings and with a few people" from "The child may demonstrate this skill however they seldom display this skill" respectively. Whereas, the 2007 version only offered consistently/always meeting criteria, inconsistently/sometimes meeting criteria or does not/never meets criteria. Secondly, the checklist was modified by taking out the portion of the checklist for instructors to list priority skills based on the items checked as a priority on the checklist. The column for identifying priority skills remained on the checklist.

4.3.3 ***Participant questionnaire***

At the completion of the study, participants were asked to answer three questions on a *Participant Questionnaire*. The questions were presented in a child-friendly format with a happy face representing the answer 'like' and a sad face representing the answer of

'dislike'. (See Appendix K for a copy of the Participant Questionnaire.) The questionnaire contained the following questions: 1) What do you think about the video?; 2) What do you think about playing with friends?; and 3) What do you think about playing with the toys?

4.4 ***Parent measures***

At the completion of the study, parents were asked to fill out a questionnaire to find out about their child's imitation and play skills. The questionnaire also surveyed whether parents would be interested in further information on video modelling. A 5-point Likert-type rating scale was used for the questionnaire. A score of 1 indicated that the parent strongly disagreed with the statement and a score of 5 indicated that the parent strongly agreed with the statement. (See Appendix L for a copy of the Parent Questionnaire.) The questionnaire contained the following statements: 1) My child's imitation skills have improved over the course of this research study; 2) My child's turn taking skills have improved over the course of this research project; 3) My child's imaginative play skills have improved over the course of this research project; 4) I would be interested in learning how to use video modelling at home; and 5) I would be interested in learning how to use video modelling in the community.

4.5 ***Teacher measures***

At the completion of the study, the participants' teacher was asked to fill out a questionnaire to find out about their students' imitation and play skills. The questionnaire also surveyed whether they would be interested in further information on video modelling. A 5-point Likert-type rating scale was used for the questionnaire. A score of 1 indicated that the teacher strongly disagreed with the statement and a score of 5 indicated that the teacher strongly agreed with the statement. (See Appendix M for a copy of the Teacher Questionnaire.) The questionnaire contained the following statements: 1) My students have improved their imitation skills over the course of this research study; 2) My students have improved their turn taking skills over the course of this research project; 3) My students have improved their imaginative play skills over the course of this research project; 4) I would be interested in learning how to use video modelling in my lessons; and 5) I would be interested in learning how to use video modelling to support my students while they are out in the community.

4.6 ***Informed consent***

Prior to implementing the experiment at the school informed consent was obtained from the appropriate school administrator and the parents of all participants. Information sheets were provided which outlined the background information and qualifications of myself, the researcher, as well as offering access to a copy of my curriculum vitae (CV) and Criminal Records Bureau (CRB) Enhanced Disclosure. (Refer to Appendices N-S for a copy of the cover sheet, information sheet and consent forms.)

4.7 ***Groupings***

Based on the age criteria for this study, ages 3-7, only two students in the communication centre at this school were selected to become participants.

4.8 ***Setting***

The setting for all sessions were held within the school that the participants attended, rather than in a contrived clinical type of setting. Sessions were conducted in three different rooms on campus due to limited space availability. However, only two sessions were conducted in one room, which was the kitchen off of the auditorium. The kitchen setting was not optimal as lighting was dim and a physical education class was in session in the adjacent auditorium at the time of the sessions. The school staff were extremely helpful in finding alternate settings to the kitchen. One day of baseline and one day of treatment following baseline was conducted in the kitchen.

Sessions conducted on Mondays and Tuesdays were held in the office meeting room. In this room, we used a rectangular table with two chairs on each side during the sessions. This was at the far end of the room. The other part of the room contained several large chairs around a low rectangular table in the middle of the room in addition to cabinets along the opposite wall.

Sessions conducted on Wednesday, Thursday and Fridays were held in a small room off the nursery classroom. The nursery classroom was not in use in the afternoons at the time of our sessions. On some occasions the room was used for individual tutoring and a dance practice on one occasion. In the small room, we used two half tables set together to make a round table with four small chairs around it.

In each room, a tripod with a digital camera mounted on it was set within a few feet of the table. In addition, a laptop was used for viewing the videotapes.

4.9 Materials

4.9.1 ***Play sets***

Three play sets were used in the study at School 2, a knights and castle play set, a pirate play set, and a space play set. The knights and castle play set included one castle, 6 knight figures, a ladder, a shooting catapult, a small cannon, a large cannon, four flags, and a flag stand. The castle also had two front doors, four extendable drawbridges, a mounted catapult, two levels, stairs, and a door that opened on the roof. See Figure 3 for a picture of the knights and castle play set.

The pirate play set included one pirate ship, 6 pirate figures, and a small cannon. The pirate ship included a look out post, a large cannon mounted at the front, two extendable gang planks, an opening hatch in the middle of the ship, and a trap door in the back of the ship. See Figure 3 for a picture of the pirates play set.

The space play set included one moon, one space shuttle, one rocket, a truck, a lunar lander, a moon rock, a space shuttle sign, a United States sign, an American standing flag and 6 astronauts. See Figure 3 for a picture of the space play set.

Figure 3. Pictures of the three play sets used in the experiment at School 2—the knights and castle play set, the pirate play set, and the space play set.

4.9.1.1 Inclusion and exclusion criteria for play sets

Inclusion criteria for the play sets were based on a thoughtful process. Play sets were considered if they met the following seven inclusion criteria. First, the toys were to be age appropriate. Second, the toys should be gender neutral. Third, they needed to be based on a theme or concept that most children would be familiar with. Fourth, there needed to be enough pieces for the participants to

share in their play. Fifth, the toys should have multiple uses, rather than one function only. Sixth, the toys needed to be open-ended, lending themselves to expand the play. And seventh, the toys should not require instructions to play with. If the toys did not meet any of the above criteria, they were not considered to be used in this study.

4.9.1.1.1 Selection of play sets

Prior to selecting the play sets which would be used in this study, the researcher looked at toy shops in person as well as internet sites for toys for this age range. Additionally, the researcher looked at the play materials available in the classroom. It was important to find play sets that could be shared among four children, as this was the size of the intervention group at this school. The children did not have any similar play sets in their classroom to the ones selected. The pirate ship, castle and space play sets met each of the inclusion criteria for this study.

4.10 Videos

In addition to the play sets, four videotapes were created by the researcher. Prior to creating the videos, a mainstream child was observed playing with each toy set. Information was gathered from these observations for possible use in the scripts for the videotapes. The researcher developed scripts to be used with the pirate ship and the knights and castle play sets. No script was developed for the space set, as this play set was used in the control sessions without the use of any videotapes. (See Appendices X-Y for a copy of the videotape scripts.)

4.10.1 Filming of videos

The videos were filmed in the same small room that the study took place in the majority of the study. This was the small room adjacent to the nursery classroom. In the videos, the two mainstream students, two boys, acted out the scripts that were created for the pirate ship and knights and castle play sets. During the taping of the videotapes, the researcher coached the mainstream children in stating the verbalizations from the scripts as well as the actions. The scripts required the model to act as a particular character by holding it, manipulating it, and speaking for it.

In chapter 3 (§3.13.1 and §3.13.2), we discussed the different video formats used in this research—one filmed from the first-person perspective (point-of-view video modelling) and the other from the third-person perspective (video modelling). For the pirate ship play set, one video was filmed from the third-person perspective (video modelling). This video was one minute, fifty-two seconds in length. For the castle play set, one video was filmed

from the first-person perspective (point-of-view video modelling). This video was one minute, twenty-three seconds in length. No video was created for the space play set, as this was used in the control sessions.

While taping the videotape from the first-person perspective (point-of-view video modelling), the video camera was held at shoulder height in between the mainstream peers to get the best point-of-view angle. This showed the participants hands acting out the various actions in a close up personal view. For the taping of the videotape filmed from the third-person perspective (video modelling), the mainstream participants could be completely seen in the video.

4.11 ***Independent and dependent measures***

4.11.1 ***Independent variable***

The independent variable was the presentation of the videotapes prior to the play sessions. The group viewed the video filmed from the third-person perspective for the first play set and the video filmed from the first-person perspective for the second play set. As there was only one group of participants at this school site, the order could not be reversed for a second group, as was done at the first school.

4.11.1.1 Dependent measures

All sessions (baseline, intervention and probes) were videotaped and later transcribed for future analysis. Data were scored from these videotapes on the occurrence of the following responses: (a) scripted verbalizations, (b) unscripted verbalizations, (c) scripted play actions, and (d) unscripted play actions. Operational Definitions are provided in the table below (Table 4).

Table 4 Operational Definitions for Dependent Measures

Operational Definitions for Dependent Measures	
Term	**Definition**
Scripted verbalizations	Verbalizations that matched the script of the model. In addition, statements that were similar to the modelled response but not identical were also scored. This included a substitution or omission of a word. (MacDonald et al., 2009).
Unscripted verbalizations	Verbalizations that were not modelled in the videotape but were appropriate to the context of play (MacDonald et al.,

	2009).
Scripted play actions	Motor actions that matched the actions of the video model and the same change to the environment occurred. (MacDonald et al., 2009).
Unscripted play actions	Play action that was not modelled in the video but was appropriate to the context of the play. (MacDonald et al., 2009).

*4.12 **Experimental design***

The research process involved both quantitative and qualitative methods. A single-subject, multiple-baseline design across participants (N=2) and three treatment conditions (video modelling from the third-person perspective, point-of-view video modelling from the first-person perspective and a control group) was implemented. The following will describe the procedure used in the experimental design: pre-intervention, baseline, intervention, post-intervention, and follow-up probes.

*4.12.1 **Pre-intervention***

A *Social Skills Checklist* was completed at the beginning of the intervention for all participants with autism in the study. This checklist has been modified from the September 2007 version by Project DATA at the University of Washington, USA. (See Appendix J for a copy of this checklist). The checklist was filled out by the parents of each participant with autism as well as their teacher.

*4.12.2 **Baseline***

Prior to the participants entering the room, the table and chairs were set up. Two chairs were placed facing the rectangular table on each of the longer sides of the table. The play set materials were placed centrally on the rectangular table. Once the participants entered the room and were seated around the rectangular table, they were provided with a visual and verbal prompt. The visual prompt was in the form of a picture of each play set. For example, as the researcher stated “First, we’re going to play pirates” while the picture of the pirate play set was pointed to. Followed by “Then play knights” while pointing to the picture of the knights and castle play set. And finally, “Then play with space and astronauts” as the picture of the space play set was pointed to. Prior to beginning play with the first play set, a timer was set and the participants were prompted, “It’s time to play.” The participants were then given four minutes to play with the toys. The experimenter stood at one end of the rectangular table next to the tripod. All baseline

sessions were videotaped for later transcribing and analysing. The two mainstream participants were in the room playing alongside the participants with autism.

4.12.3 ***Intervention***

During intervention sessions, the participants with autism were prompted to sit in front of a laptop. The visual schedule was modified with the addition of a picture of the laptop. The participants were prompted, "First, we're going to watch a movie, then play pirates. Then we are going to play knights, then space and astronauts." The video was then started with a prompt, "Let's watch." If a participant looked away from the video while it was presented, he was then prompted visually to look at the video. If needed, a verbal prompt was added. Following the video, the children were directed to play with the materials. As in baseline, the participants were given four minutes to play with the toys. The experimenter stood at one end of the rectangular table next to the tripod. All intervention sessions were videotaped for later transcribing and analysing. The two mainstream participants were in the room playing alongside the participants with autism.

With the pirates play set, the group was presented with the video filmed from the third-person perspective. With the knights and castle play set, the group was presented with the video filmed from the first-person perspective.

4.12.4 ***Control Group***

During the control group phase involving the third play set, just as in the baseline phase, a timer was set and the participants were prompted, "It's time to play." The participants were then given four minutes to play with the toys. The experimenter stood at one end of the rectangular table next to the tripod. All control group sessions were videotaped for later transcribing and analysing. The three mainstream participants were in the room playing alongside the participants with autism. Throughout this phase, the participants were not presented with any video as in the intervention phase. As this play set did not have a video presentation, a script was not developed. However, a list of functional play actions for this play set was created. This will be discussed in the results chapter (§6.2.3).

4.12.5 ***Post-intervention***

Another *Social Skills Checklist*, as in pre-intervention, was completed at the end of the intervention for all participants with autism in the study. The checklist was filled out by the parents of each participant with autism as well as their teacher. Additionally,

questionnaires were completed by the participants with autism, their parents and their teachers. (See Appendices K-M for a copy of the Participant, Parent and Teacher Questionnaires).

Typically two types of instruments are used to assess social skills, norm-referenced tests and informal assessments (Volkmar et al., 2014). The Social Skills Checklist is an informal assessment instrument. It is not a norm-referenced test that rates a person's social skills based on a normative sample. As such, it can be used to provide a further understanding of the participants' social skills strengths as well as their challenges. Additionally, it can provide information which can guide a social skills intervention. Informal assessments can also be used pre- and post-treatment to measure treatment effectiveness (Volkmar et al., 2014). The purpose of using The Social Skills Checklist was twofold. First, I believe that including a social skills screening tool pre- and post-intervention could strengthen the literature in this area (see §2.4.1.4). Second, by using this tool I hoped to understand whether there would be a periphery change the participants' social skills which may or may not be directly linked to this study. In light of the fact that the Social Skills Checklist was not used as an outcome measure, the administration of the checklist post-treatment after such a short period of time from the first administration was appropriate.

4.12.6 ***Follow-up probes***

Three weeks following the completion of the study, a one-time follow-up probe was conducted. In this probe, the videotapes were not presented. The participants were presented with the play sets and the same visual and verbal prompts as in baseline. As in previous sessions, the participants were given four minutes to play with the toys. The experimenter stood at one end of the rectangular table next to the tripod. The follow-up probe session was videotaped for later transcribing and analysing. The two mainstream participants were in the room playing alongside the participants with autism.

4.13 ***Data Analysis***

The holistic theoretical approach to this study influenced the amount of data collected. The data was collected from a variety of sources to provide an in-depth understanding of the research problem. Due to the multifaceted nature and volume of the data collected in this study, it would be helpful to look at the types of data collected.

The following lists the data collected in this study:

- Teacher interview
- Review of educational records and assessments for each participant in the study.
- Videotapes from all sessions (baseline, intervention and follow-up), across three treatment conditions (video modelling from the third-person perspective, point-of-view video modelling from the first-person perspective, and a control group).
- Transcriptions of all videotaped sessions (see above).
- Scripted and unscripted play behaviours of each participant for each play set visually displayed in the form of graphs.
- *Social Skills Checklist*, pre- and post-intervention, completed by the participants' parents and teachers.
- Questionnaires post-intervention from participants, teachers and parents.

Data from descriptive narrative records was analysed using event recording. The following table (Table 5) presents the phases involved in the data trail.

Table 5 Phases of the data trail.

1st Phase	• Educational Records and teacher interviews reviewed for relevance to participants' background information.
2nd Phase	• Videotaped sessions were viewed and transcribed verbatim for each participant. The participants' actions and verbalizations were recorded methodically.
3rd Phase	• Actions and verbalizations for the VM and POVM transcripts were coded based on operational definitions criteria. • Spreadsheets were created for each participant, for each VM and POVM condition. • Functional play actions for the control group conditions were identified. • Functional play actions from the control group transcripts were coded based on established criteria.
4th Phase	• Scripted and unscripted play behaviours identified in the above phase were visually displayed in graphs for both the VM and POVM conditions. • Functional play actions identified for the control group in the above phase were visually displayed in graphs.
5th Phase	• Completed social skills checklists were reviewed. Data was generated and presented in a table format to identify any changes

	in participants' behaviour post-intervention. • Completed questionnaires were reviewed. Data was generated and presented in a table format to include input from participants, teachers, and parents.
6th Phase	• Graphs displaying the scripted and unscripted play behaviours were visually analysed. • All data combined was analysed and presented using a mixed-methods approach.

4.13.1 ***Reliability***

Every attempt has been made to clearly articulate the steps of the methodology employed in this study in order to allow for future replication. If other researchers are able to perform the same experiment as outlined in this study, using the same conditions and generating similar results would speak to the reliability of this study (Rudestam and Newton, 2007). Reliability in the form of interobserver agreement will be discussed further in the results chapters (5 and 6, §5.4 and §6.3 respectively).

4.13.2 ***Internal Validity***

Internal validity in research refers to how well the study was conducted and whether the independent variable could be identified as the change agent for the dependent variable. Factors implemented to control internal validity in this study included random selection of participants (see §3.10), consistency in implementation of the experimental design during both experiments (see §3.15 and §4.12) and the use of a control group (see §4.12.4). Additionally, internal validity has been ensured by videotaping of all sessions, across groups and treatment conditions. This included the videotaping of the participants while they viewed the video presentation. In doing so, data could be compared from what was observed to what was recorded.

4.13.3 ***External Validity***

External validity in research refers to how well the results of the study can be generalized. One possible threat to external validity is that of order effects. Order effects is a change in the participants' behaviour due to the order in which the treatment conditions are presented. Order effects is attributable to practice and even fatigue (McLeod, 2007; Cozby, 2009). For example, having learned something already in the first condition, participants may know what to do in the second condition. This is known as practice effect. With fatigue effect, participants may become tired of the condition and may

perform worse than in the first condition. In order to reduce the possibility of order effects within groups in this study, counterbalancing of order treatments was implemented (see §3.15.3 and §4.12.3) (McLeod, 2007). By this, I mean that each group of participants was presented with a different order of treatment conditions for school #1. For school #2, as there was only one group of participants, the group viewed the video filmed from the third-person perspective for the pirates play set, while the group viewed the video filmed from the first-person perspective for the knights and castle play set.

Finally, to help improve the likelihood that this study could be generalized and replicated, necessary care was taken in clearly describing the participants and each of the steps involved in this study's methodology.

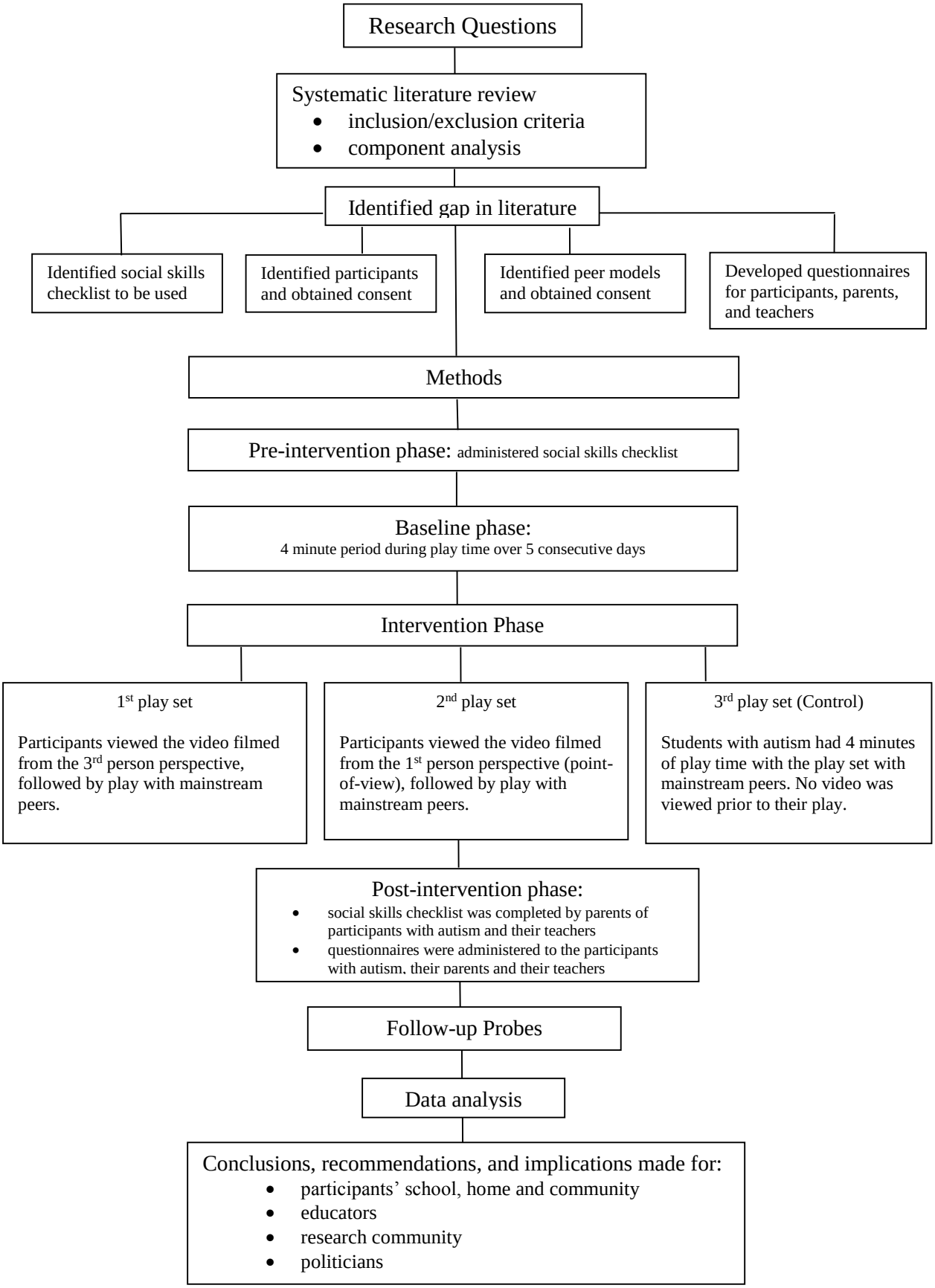
*4.14 **Methodology diagram***

The following page provides a methodology diagram for an overview of the steps involved in the implementation of this study. (See Figure 4.)

4.15 Summary

The chapter provided an in-depth discussion on the methods for the second experiment in this research, including the ethical considerations, participants, measures, procedures, experimental design and data analysis. It also provided a methodology diagram of the entire research process. The next chapter will present the findings of the first school experiment and the results of the feedback received from the stakeholders in this study—the participants, their parents and their teachers.

Figure 4. Methodology Diagram for Experiment #2



Chapter 5. School #1 Results

5.1 ***Introduction***

In this chapter, the descriptive findings of the data obtained in the first school experiment will be presented and will be discussed in the discussion chapter (chapter 7) to follow. The first section of this chapter will present quantitative and qualitative results across participants and the frequency of the social behaviours that the participants demonstrated. In the second section, information gathered from a visual inspection of the data will be presented. The third section will introduce the results from the feedback received from the participants, their parents and their teachers.

It should be noted that first the data needs to be unpacked before looking at answering the question as to which video modelling intervention impacted the imitation skills of the children with autism the most.

5.2 ***Quantitative and Qualitative Results across Participants for Group 1, Experiment #1, School #1***

Group #1 involved two participants, John and David. In the following subsections, a summary of the participants' scripted behaviours, unscripted behaviours and qualitative findings of their play behaviours will be provided. First the findings of their social behaviours with the farm play set will be presented (see §5.2.1), followed by the findings of their behaviours with the town play set (see §5.2.2), and finally the findings of their behaviours with the fairground play set (see §5.2.3).

5.2.1 ***Group 1 Farm Play Set Results***

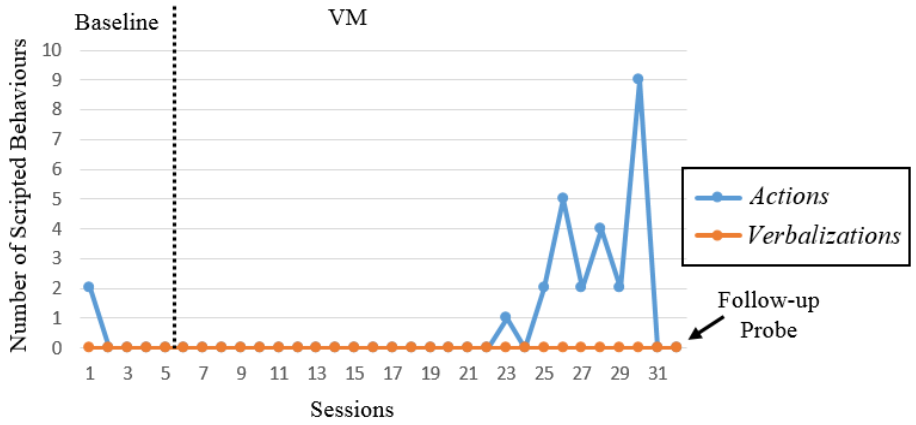
This group was shown the video of mainstream peers playing with the farm play set which was filmed from the third-person perspective—video modelling (VM). See §3.12.1 for a picture of the farm play set and a listing of the toys available to play with.

5.2.1.1 **Group 1, Participant 1 – John**

5.2.1.1.1 ***John's scripted behaviours for the farm play set***

The rate of John's scripted play actions and verbalizations for the farm play set are shown in Figure 5.

Figure 5. John's scripted play actions and verbalizations for the farm play set



Following the introduction of the video modelling intervention in session 6, John's *scripted play actions* increased from a mean baseline level of 0 (range 0-2) to a mean level of 1 (range 0-9). He demonstrated scripted actions in 8 out of 32 sessions, which equates to about 25% of sessions. In looking at Figure 5, one will notice that his scripted actions remained within a small number (N=0-9). He demonstrated the highest number of scripted actions during sessions 26, 28 and 30 (N=5, 4 and 9 respectively). In looking at Figure 5, one can note that John's scripted actions were almost non-existent until session 23. From sessions 25-31 there is a variable increase in his scripted actions. However, it should be noted that during sessions 26-32 John wore special coloured glasses to each session. Further findings regarding this variable will be discussed in the qualitative findings section for the farm play set (§5.2.1.1.3). John did not demonstrate any scripted actions on the last session that he participated in prior to the follow-up session. Additionally, he did not demonstrate any scripted actions during the follow-up session, which took place three weeks after the intervention ended. The table below (Table 6) lists John's scripted play actions that he demonstrated from baseline throughout the intervention.

Table 6. John's scripted play actions for the farm play set

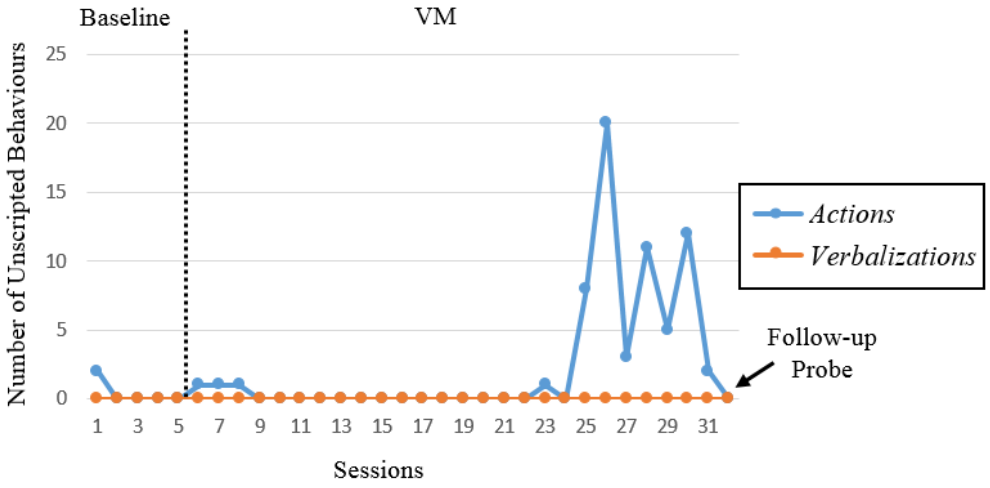
Scripted Play Actions	***Session(s)***
Opened the door to the cow area	1, 30
Opened the door to the pig area	25-30
Took the pig out	25, 27-30
Took the sheep out	30

John did not demonstrate any *scripted verbalizations* from baseline throughout the intervention (M=0, range 0).

5.2.1.1.2 ***John's unscripted behaviours for the farm play set***

The rate of John's unscripted play actions and verbalizations for the farm play set are shown in Figure 6.

Figure 6. John's unscripted play actions and verbalizations for the farm play set



Following the introduction of the video modelling intervention in session 6, John's *unscripted play actions* increased from a mean baseline level of 0 (range 0-2) to a mean level of 3 (range 0-20). He demonstrated unscripted actions in 12 out of 32 sessions, which equates to about 38% of sessions. He demonstrated the highest number of unscripted actions in sessions 25, 26, 28 and 30 (N=8, 20, 11 and 12 respectively). In looking at Figure 6, one can note that John's unscripted actions were almost non-existent until session 23. From sessions 25-30 there is an increase in his unscripted actions. As stated before, John wore special coloured glasses to each session during sessions 26-32. Further findings regarding this variable will be discussed in the qualitative findings section for the farm play set (§5.2.1.1.3). On the last session that he participated in prior to the follow-up session, John demonstrated 2 unscripted actions. At the follow-up session, which took place three weeks after the intervention ended, he did not demonstrate any unscripted actions.

Table 7. John's unscripted play actions for the farm play set

Unscripted Play Actions	***Session(s)***
Closed the door to the cow area	1
Drove the tractor back and forth	8, 26, 29
Changed the direction the tractor was driven	29
Placed the bucket next to the pig inside the pig's area	26
Placed the hay next to the pig in the pig's area	29

Closed the door to the pig area	26
Removed the hay from the wheelbarrow	26
Opened the door to the silo	26
Closed the door to the silo	26
Removed the hay from the pig area	30

John did not demonstrate any *unscripted verbalizations* from baseline throughout the intervention (M=0, range 0).

5.2.1.1.3 ***John's qualitative findings for the farm play set***

After reviewing the videos and their transcriptions for all sessions involved with the farm play set, several observations can be made about John's social behaviours. John often required adult prompting to look at the table and the toys in front of him (sessions 1, 5, 10, 11, 12, 15 and 16). When prompted, an adult would sign "look" and "choose" (for "choose something to play with"). If the visual prompt was not responded to, a verbal prompt was provided as well as the sign. During sessions, John visually focused on other people or other areas in the room rather than the play items themselves.

He did demonstrate some sensory-related behaviours such as rocking side to side in his chair, covering his eyes, hand stereotypy and finger raking of object surfaces. For example, he could be seen raking the surface under the wheelbarrow with his fingers in session 12 and the floor of the pig area in session 18. He appeared to seek out attention from the classroom assistant as well as the researcher by looking at them, smiling, grinning and shaking his head side to side as if stating "no" (sessions 12, 13, 15, 16, 17, 18, 19, 20, and 22).

John would often pick up a toy and bring it to his lap. However, he would not interact with the toy or animate the toy (sessions 14, 15, 16, 17 and 20). For example, during session 17, John was prompted to choose a toy. He picked up a horse and brought it to his lap. He held the horse with both of his hands, glancing at it from time to time. While holding the horse, he was prompted to play. He responded by shaking his head side to side as if to say "no". He held the horse for two minutes and forty-seven seconds without interacting with the horse or animating it.

During sessions 26-32 John wore special coloured glasses to each session. He began wearing his coloured glasses while the school was on a term break. The lenses were red in colour and were prescribed by a multi-sensory optician. During the sessions which John

wore the coloured lenses, he appeared to be more aware of his social partners, their actions, and the toys available to play with. From session 26-32 his scripted actions ranged from 2-9 and unscripted actions from 2-20. These were the highest levels observed in the entire intervention. Due to the change in his environment (i.e. wearing coloured lenses), a direct correlation between video modelling and the results cannot be made. However, although it is not the topic of this particular research, in light of the notable change in John's behaviour while wearing his coloured glasses, it would be interesting to conduct research involving coloured lenses to see whether there is a correlation with the wearing of coloured lenses and a change in behaviours of children with autism.

5.2.1.2 **Group 1, Participant 2 – David**

5.2.1.2.1 ***David's scripted behaviours for the farm play set***

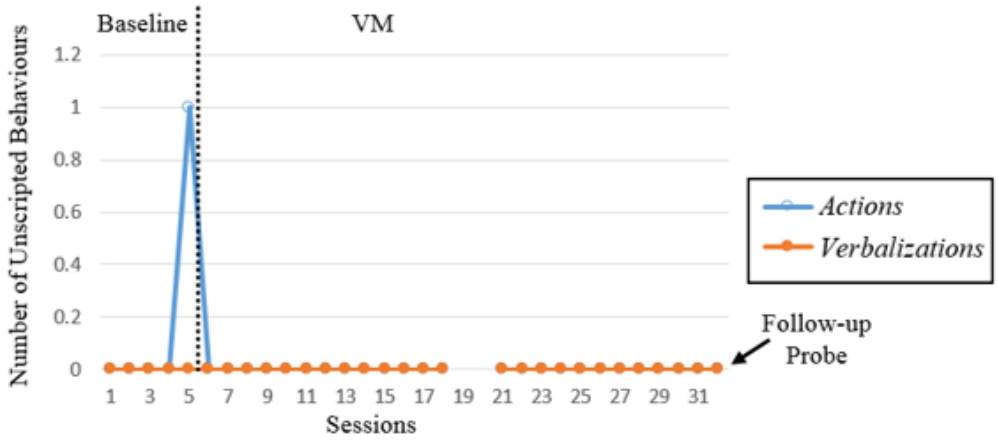
David did not demonstrate any *scripted play actions* from baseline throughout the video modelling intervention (M=0, range 0).

David did not demonstrate any *scripted verbalizations* from baseline throughout the intervention (M=0, range 0).

5.2.1.2.2 ***David's unscripted behaviours for the farm play set***

The rate of David's unscripted play actions and verbalizations for the farm play set are shown in Figure 7.

Figure 7. David's unscripted play actions and verbalizations for the farm play set



Following the introduction of the video modelling intervention in session 6, David's *unscripted play actions* decreased from a mean baseline level of 0 (range 0-1) to a mean level of 0 (range 0). In session 5, David demonstrated one scripted action as can be seen in Table 8 below.

Table 8. David's unscripted play actions for the farm play set

Unscripted Play Actions	***Session(s)***
Moved the blue wheelbarrow back and forth by pulling the handle	5

David did not demonstrate any *unscripted verbalizations* from baseline throughout the intervention (M=0, range 0).

5.2.1.2.3 ***David's qualitative findings for the farm play set***

After reviewing the videos and their transcriptions for all sessions involved with the farm play set, several observations can be made about David's social behaviours. The rate of David's targeted play behaviours were non-existent with the exception of one session. On session 5, David did reach for the blue wheelbarrow and moved it back and forth by pulling the handle.

David demonstrated minimal non-functional play behaviours. For example, he would often pick up the yellow fence that contained four interlocking pieces. He would then bend the interlocking pieces at the joints back and forth continuously. Once the pieces would fall apart, he would lay the pieces on the table or would take a single unit and bend that piece in the middle back and forth. If a peer reconnected the fence pieces, David would pick them up and repeat the process of bending them back and forth until the fence pieces separated. At times, he would spend the entire session focused on the fence (session 3). If he continued to bend the pieces, the researcher moved them away from the table. For example, during session 16, he spent the first minute of the four-minute farm play session focused on the fence. The fence pieces were then moved away. His behaviours with the fence pieces could be seen as either sensory-related or repetitive and ritualistic.

David exhibited some sensory-related behaviours such as leaning far back in his chair while holding the table's edge with his fingertips, pulling himself forward then leaning

back again (session 12). He would often bite his own wrist or knee (sessions 4, 7, 10, and 11). At other times, he would cover his ears (sessions 8, 11) or his eyes (sessions 6, 8).

He often appeared to not connect visually with the play actions of his peers or with the materials to play with. For example, during session 13, he kept his finger to his mouth, playing with his lower lip. Visually he was looking forward, as if in a daze, or looking downward or to the window area. Even when prompted to look at the toys or to choose a toy to play with, he did not respond. Although he would be seen picking up a toy and bringing it to his lap, he did not interact with the toy or animate it. For example, during session 16, he had focused on the fence pieces for the first minute of the four-minute play session. Once the fence pieces were removed, he was prompted at 2 minutes, 16 seconds to choose something to play with. He did not respond. He also did not appear to visually connect with the actions of his peers or the presence of the objects. At 3 minutes, 12 seconds, he was prompted again to choose something to play with. He responded by looking at the researcher and smiling. He was then prompted with a hand on his elbow and a pointed finger towards the table. At 3 minutes, 17 seconds, he picked up the horse, glanced at it. He then held onto the horse's feet in an upside down position, repositioning it to an upright position then upside down again. He held the horse in his lap for the remainder of the session (43 seconds) without any interaction with it or animating it.

On other occasions, when David was prompted to play, he would select a toy, then hand it over to the researcher or the classroom assistant. For example, during session 21, when prompted to choose something to play with, David picked up the blue wheelbarrow. He then looked at the researcher and handed it to her. She pointed for him to keep it. He handed the wheelbarrow to her. The researcher handed it back to him. He held it for a while then returned it to the table. On this occasion, no additional prompting or support was provided. On another occasion, during session 24, once prompted to choose something to play with, he picked up a horse and handed it to the researcher. He was prompted verbally "you play with it" and physically by prompting his hand with the horse back to the table. He grasped the researcher's hand. The researcher tapped the horse on the table. He picked it up and extended it towards the researcher. She did not respond. He then brought the horse to his lap. After rocking in his chair for a bit and biting on the horse, he then kept the horse in his lap for the remainder of the session.

Overall, throughout the sessions, David appeared passive in his play. At times, he demonstrated a lack of engagement and a lack of awareness of his peers and the toys in front of him.

*5.2.2 **Group 1 Town Play Set Results***

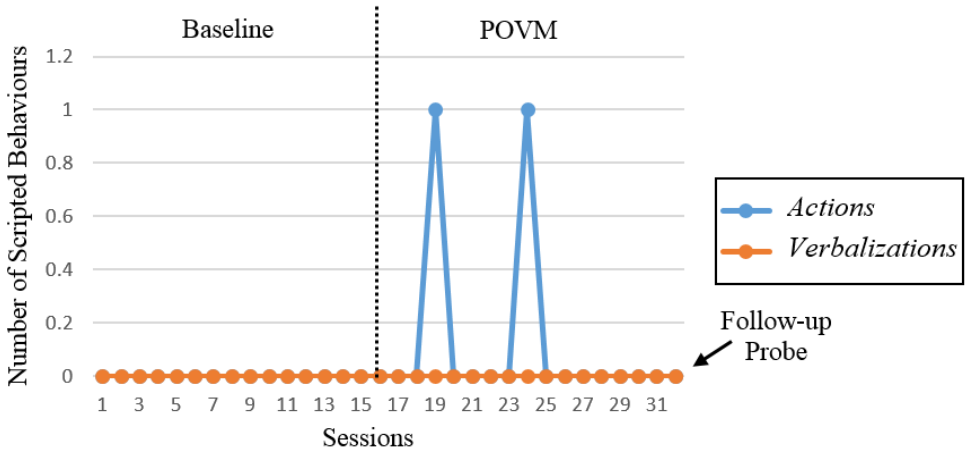
This group was shown the video of mainstream peers playing with the town play set which was filmed from the first-person perspective—point-of-view video modelling (POVM). See §3.12.1 for a picture of the town play set and a listing of the toys available to play with.

5.2.2.1 **Group 1, Participant 1 – John**

5.2.2.1.1 ***John's scripted behaviours for the town play set***

The rate of John's scripted play actions and verbalizations for the town play set are shown in Figure 8.

Figure 8. John's scripted play actions and verbalizations for the town play set



Following the introduction of the point-of-view video modelling intervention in session 16, John's *scripted play actions* slightly increased from a mean baseline level of 0 (range 0) to a mean level of 0 (range 0-1). He demonstrated one scripted play action in sessions 19 and 24 only, as reflected in Table 9 below.

Table 9. John's scripted play actions for the town play set

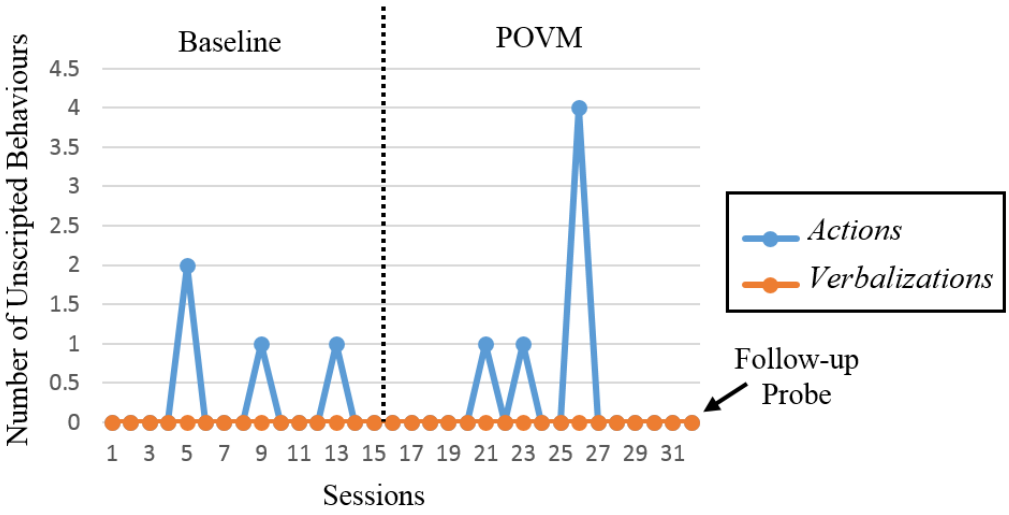
Scripted Play Actions	***Session(s)***
Opened the door to the tea shop	19, 24

John did not demonstrate any *scripted verbalizations* from baseline throughout the point-of-view video modelling intervention (M=0, range 0).

5.2.2.1.2 ***John's unscripted behaviours for the town play set***

The rate of John's unscripted play actions and verbalizations for the town play set are shown in Figure 9.

Figure 9. John's unscripted play actions and verbalizations for the town play set



Following the introduction of the point-of-view video modelling intervention in session 16, John's *unscripted play actions* increased slightly from a mean baseline level of 0 (range 0-2) to a mean level of 0 (range 0-4). John demonstrated unscripted play actions in sessions 5, 9, 13, 21, 23 and 26 (N=2, 1, 1, 1, 1 and 4 respectively). He demonstrated the highest number of unscripted play actions in session 26 (N=4). As stated before, John wore special coloured glasses to each session during sessions 26-32.

Table 10. John's unscripted play actions for the town play set

Unscripted Play Actions	***Session(s)***
Moved the boy character back and forth on the table	5
Pulled the police woman character out of the window of the tea shop and stood her on the table	9
Opened the door to the toy shop	5, 13, 21

John did not demonstrate any *unscripted verbalizations* from baseline throughout the point-of-view video modelling intervention (M=0, range 0).

5.2.2.1.3 ***John's qualitative findings for the town play set***

Similar to the results obtained during the farm set, the rate of John's targeted play behaviours were at a very low to non-existent level for three quarters of the sessions in this experiment. Out of the 32 sessions in total, John demonstrated targeted play behaviours during 8 sessions only (sessions 5, 9, 13, 19, 21, 23, 24, and 26).

John appeared to enjoy the sounds available in the town set (the welcome mats, phones and cash registers of the three buildings as well as the phone in the phone booth). At times, he would repeatedly push the buttons to hear the sounds. For example, during session 7, John held the button down on the phone booth to hear it ring 25 times. He would move a building closer to him in order to push the buttons for sound. Often, John would repeatedly push buttons in the various buildings, one after the other. For example, during session 8, he pushed the button to sound the phone in the toy shop, followed by the tea shop, then the post office, followed by the toy shop again. However, he did not hold any character while pushing the buttons for sound (i.e. character as agent). He would use his hand to activate the sound, without animating any character.

As seen in the farm sessions, John would use his fingers to make a raking motion under objects. This could be seen in session 12 as John lifted up the grandfather character and stroked the table under him, then stood him back on the table. Later in the same session, he lifted up the post office and stroked the table beneath it, before setting the building down again. His behaviours were consistent to that of the farm sessions, in that he would often glance around the room and appear to not connect visually with the play behaviours of his peers or the toys available to play with (session 14). In one particular session (session 15), John demonstrated a lack of engagement. This was evidenced when he shook his head "no" in response to prompts to look at toys and to choose something to play with five times within the session.

As with the farm play set, during sessions 26-32 John wore his special coloured glasses to each session. However, unlike the farm play set, no notable changes in his play behaviour was noted during the town play set sessions. He only exhibited four unscripted actions during session 26, with no actions during sessions 27-32. This raises the question as to whether the coloured lenses directly changed John's behaviour in regards to the farm play set and/or could they have enhanced the setting of a play set that he had interest in,

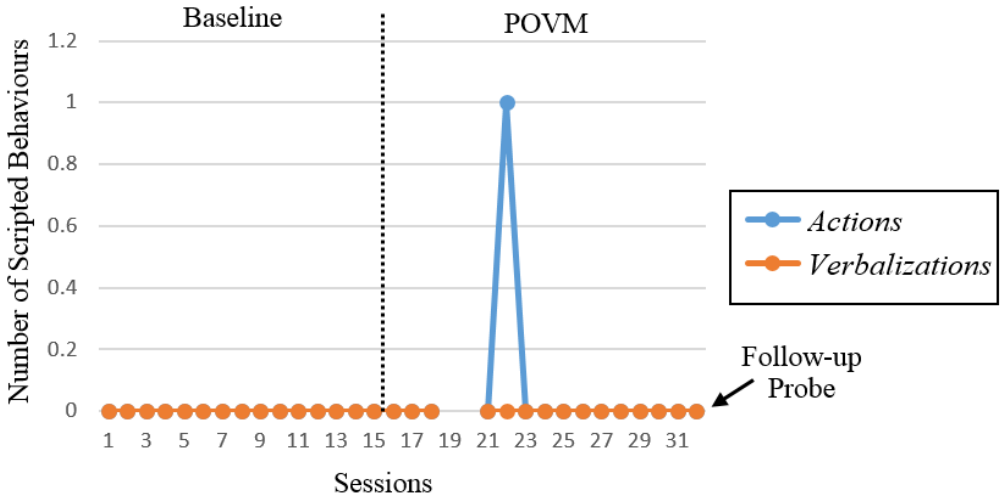
whereas the same could not be said for the town play set. A definitive answer cannot be stated at this time.

5.2.2.2 **Group 1, Participant 2 - David**

5.2.2.2.1 ***David's scripted behaviours for the town play set***

The rate of David's scripted play actions and verbalizations for the town play set are shown in Figure 10.

Figure 10. David's scripted play actions and verbalizations for the town play set



Following the introduction of the point-of-view video modelling intervention in session 16, David's *scripted play actions* slightly increased from a mean baseline level of 0 (range 0) to a mean level of 0 (range 0-1). He demonstrated one scripted play action in session 22 only as reflected in Table 11 below.

Table 11. David's scripted play actions for the town play set

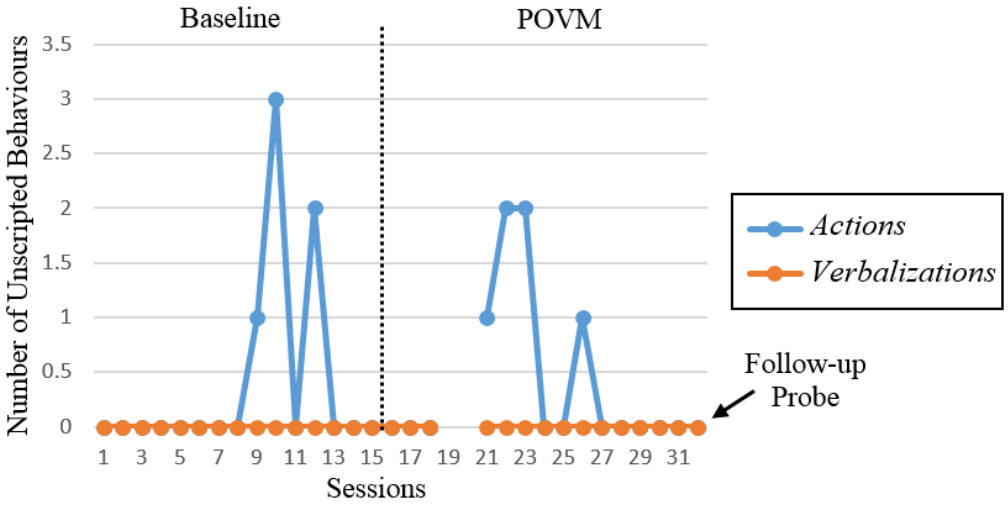
Scripted Play Actions	***Session(s)***
Opened the door to the tea shop	22

David did not demonstrate any *scripted verbalizations* from baseline throughout the point-of-view video modelling intervention (M=0, range 0).

5.2.2.2.2 ***David's unscripted behaviours for the town play set***

The rate of David's unscripted play actions and verbalizations for the town play set are shown in Figure 11.

Figure 11. David's unscripted play actions and verbalizations for the town play set



Following the introduction of the point-of-view video modelling intervention in session 16, David's *unscripted play actions* decreased in range slightly from a mean baseline level of 0 (range 0-3) to a mean level of 0 (range 0-2). David demonstrated unscripted play actions in 7 out of 32 sessions, which equates to about 22% of sessions. He demonstrated the highest number of unscripted play actions in session 10 (N=3).

Table 12. David's unscripted play actions for the town play set

Unscripted Play Actions	***Session(s)***
Closed the door to the tea shop	9, 10, 12, 21
Closed the door to the toy shop	10, 21-23, 26
Opened the door to the toy shop	12

David did not demonstrate any *unscripted verbalizations* from baseline throughout the point-of-view video modelling intervention (M=0, range 0).

5.2.2.2.3 ***David's qualitative findings for the town play set***

Similar to the results obtained during the farm play set, the rate of David's targeted play behaviours were at a very low to non-existent level for three quarters of the sessions with the town play set. Similar to his demeanour as in the farm play sessions, David did not appear to connect visually with the actions of his peers or the toys available to play with. However, he did appear to enjoy the sounds made by pushing on the welcome mat, phones and cash registers in the town set.

During some sessions, David appeared to seek out sensory input. For example, during session 18, the classroom assistant was providing some pressure to his shoulders and upper arms. When she removed her hands, he reached for her hand. Later in the session, he reached for the assistant's hand. She did not respond to him and pulled her hand forward. He proceeded to bite his wrists, then grabbed her hand and tried to put it on his head vocalizing "eh, eh". She applied some pressure to his shoulders. He then vocalized a cry of sorts and brought her hands to his ears while he covered his eyes with his right hand and placed his left hand on his left ear.

Similar to his responses to prompts to choose something to play with in the farm sessions, he would often select a toy and extend it to the researcher (sessions 24, 27, 30, and 32). Attempts were made to model some play behaviours for him. For example, modelling walking a character on the table (session 24, 25, 31, and 32). In each instance, he did not give a response to the model. Rather, he demonstrated sensory-related behaviours of covering his eyes or ears, as well as biting on objects or his own wrists and knees, as observed in previous play sessions. It is difficult to say whether he was disregulated at the time or if he was demonstrating these sensory-related behaviours as a coping mechanism or to escape the request.

Similar to the findings of the farm play set, David did not demonstrate any *scripted or unscripted verbalizations* from baseline throughout the intervention for the town play set.

5.2.3 ***Group 1 Fairground Play Set Results (Control Group)***

The participants did not watch any video or receive any specific instructions prior to their play with this play set. Following the prompt to play, participants and their mainstream peers played with the fairground play set for four minutes. See §3.12.1 for a picture of the fairground play set and a listing of the toys available to play with.

As this play set did not have a video presentation, a script was not developed. However, a list of 13 functional play actions for this play set was created. They can be found in Table 13 below.

Table 13. Functional play actions for the fairground play set

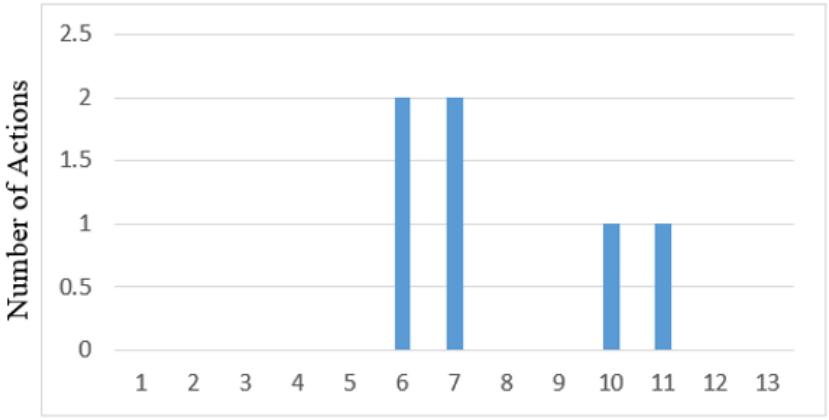
1	Placed character in the rocket ride
2	Took character out of the rocket ride
3	Swung rocket ride with a character in it
4	Walked character on or off the steps from the rocket ride
5	Placed character on a horse in the carousel
6	Took character off a horse in the carousel
7	Spun the carousel ride with a character in it
8	Placed character on the steps of the carousel
9	Placed character on the button for music for the carousel
10	Placed character in the ship ride
11	Took character out of the ship ride
12	Swung ship ride with a character in it
13	Walked character on the table

5.2.3.1 **Group 1, Participant 1 – John**

5.2.3.1.1 ***John's functional play actions for the fairground play set***

The rate of John's functional play actions for the fairground play set are shown Figure 12. Over the course of 13 sessions, John demonstrated 6 functional play actions. He demonstrated the following actions: took character off the horse in the carousel (33%; N=2), spun carousel with a character in it (33%; N=2), placed character in ship ride (17%; N=1), and took character out of the ship ride (17%; N=1). He did not demonstrate any other possible functional play actions for this play set.

Figure 12. John's functional play actions for the fairground play set



5.2.3.1.2 *John's verbalizations for the fairground play set*

John did not demonstrate any verbalizations during the 13 sessions for the fairground play set.

5.2.3.1.3 *John's qualitative findings for the fairground play set*

While playing with the fairground play set, John demonstrated self-stimulatory behaviours such as rocking in his chair and hand stereotypy (sessions 2 and 10). He also spun the fairground rides repeatedly without a character in the ride (sessions 1, 3, 5, 6, 7, 9, 10, 11, 12 and 32). This type of action could be classified as either self-stimulatory or repetitive or ritualistic in nature. He also pushed the button on the carousel ride to activate the sound (sessions 1, 4, 5, 9 and 32). Often when he pushed the button on the carousel for sound, he would smile.

As seen with the town play set, at times John demonstrated a lack of engagement. This was evidenced when he shook his head "no" in response to prompts to look at toys and to choose something to play. For example, in session 32, he smiled at the researcher then shook his head "no" when prompted to play. Further, his social behaviours in this session were typical of the sessions with the other two play sets. He did not respond when his name was called on two occasions. He was prompted to choose something to play on four occasions and he held characters in his lap for 2 ½ minutes, out of the four-minute play session, without any interaction with them.

5.2.3.2 **Group 1, Participant 2 – David**

5.2.3.2.1 *David's functional play actions for the fairground play set*

David did not demonstrate any of the possible functional play actions during the 13 sessions for the fairground play set.

5.2.3.2.2 *David's verbalizations for the fairground play set*

David did not demonstrate any verbalizations during the 13 sessions for the fairground play set.

5.2.3.2.3 *David's qualitative findings for the fairground play set*

David's social behaviours were very similar while playing with the fairground play set as with the previous two play sets. He exhibited some sensory-related behaviours such as

rocking in his chair (sessions 1 and 4), holding his hands over his eyes and ears (sessions 2 and 11) and biting or mouthing objects (sessions 7, 11 and 12). He often sought out sensory input to his shoulders and head (sessions 1, 2 and 7). He would also bite himself (sessions 2, 3, 4, 6, 10 and 11).

Similar to the findings from the other play sets, David did not appear to connect visually with the actions of his peers or the toys available to play with. He was prompted on several occasions to look at the toys (sessions 4, 6, and 11) often without a response. However, he did appear to enjoy the sounds made by the carousel when he pushed the button to activate it (sessions 4 and 5). This behaviour is similar to that of the previous play sets. He would also spin the carousel when it was empty (session 12). His preference for the sounds and spinning of the rides could be seen as either self-stimulatory or as a repetitive type of behaviour.

*5.3 **Quantitative and Qualitative Results across Participants for Group 2, Experiment #1, School #1***

Group #2 involved three participants, Esther, Liam, and Joseph. In the following subsections, a summary of the participants' scripted behaviours, unscripted behaviours and qualitative findings of their play behaviours will be provided. First the findings of their social behaviours with the farm play set will be presented (see §5.3.1), followed by the findings of their behaviours with the town play set (see §5.3.2), and finally the findings of their behaviours with the fairground play set (see §5.3.3).

*5.3.1 **Group 2 Farm Play Set Results***

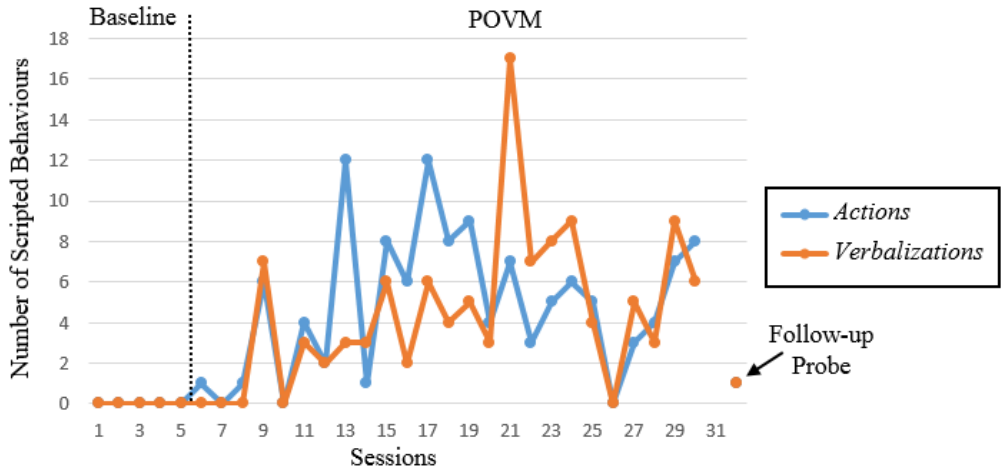
This group was shown the video of mainstream peers playing with the farm play set which was filmed from the first-person perspective—point-of-view video modelling (POVM). See §3.12.1 for a picture of the farm play set and a listing of the toys available to play with.

*5.3.1.1 **Group 2, Participant 1 – Esther***

5.3.1.1.1 ***Esther's scripted behaviours for the farm play set***

The rate of Esther's scripted play actions and verbalizations for the farm play set are shown in Figure 13.

Figure 13. Esther's scripted play actions and verbalizations for the farm play set



Following the introduction of the point-of-view video modelling intervention (session 6), Esther's *scripted play actions* increased from a mean baseline level of 0 (range 0) to a mean level of 5 (range 0-12). She demonstrated scripted actions in 23 out of 32 sessions, which equates to about 72% of sessions. It should be noted that she was absent on one day of the 32 sessions. She demonstrated the highest number of scripted actions in sessions 13, 15, 17, 18 and 19 (N=12, 8, 12, 9 and 9 respectively). In looking at Figure 13, one can note a good momentum of increased scripted actions over the course of the intervention phase. On the last session that she participated in prior to the follow-up session, Esther demonstrated 8 scripted actions, which is higher than the average mean throughout the intervention. At the follow-up session, which took place three weeks after the intervention ended, she only demonstrated one scripted action.

Table 14. Esther's scripted play actions for the farm play set

Scripted Play Actions	***Session(s)***
Slid the rooster from side to side	8, 9, 11, 13, 16, 17, 20, 25, 29, 30
Closed the gate to the cow area	9, 16, 24, 29, 30
Removed the cows from the cow area	9
Put the cows back in the cow area	25
Took the sheep out	9
Brought the pig out	11, 22
Put the pig back in the pig area	13
Closed the gate to the pig area	6, 13
Sat the pig in front of the bucket	11, 13, 14
Laid a character down in the upstairs of the barn	13, 16, 17, 22, 23, 29, 30
Moved farmer along with the blue wheelbarrow	12, 13, 15, 17, 18-

	21, 24, 32
Dumped the hay out of the blue wheelbarrow	12, 13, 15, 17-21, 23, 24, 29, 30
Placed the horse next to the hay	19, 20, 21, 23, 27-30
Moved a character to clean the stable	30

Esther's *scripted verbalizations* increased from a mean baseline level of 0 (range 0) to a mean level of 4 (range 0-17) following the introduction of the point-of-view video (session 6). She demonstrated scripted verbalizations in 21 out of the 31 sessions she participated in, which equates to about 68% of sessions. She demonstrated the highest number of scripted verbalizations in sessions 21, 23, 24 and 29 (N=17, 8, 9 and 9 respectively). Similar to the findings on scripted actions, in looking at Figure 13, one can see a steady increase of scripted verbalizations over the course of the intervention phase. On the last session that she participated in prior to the follow-up session, Esther demonstrated 6 scripted verbalizations, which is higher than the average mean throughout the intervention. At the follow-up session, which took place three weeks after the intervention ended, she only demonstrated one scripted verbalization.

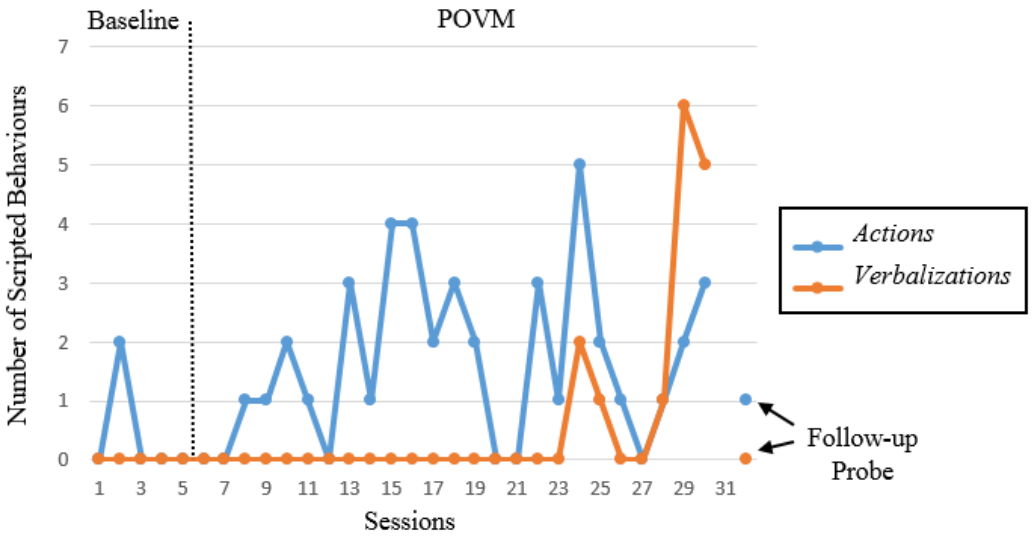
Table 15. Esther's scripted verbalizations for the farm play set

Scripted Verbalizations	***Session(s)***
"Cock-a-doodle-doo."	9, 11, 16, 20, 22, 24, 32
Sang the "do-do" jingle.	9, 11-19, 21-24
"Let's get some sleep now."	17, 18, 21-23, 25, 29-30
"Good night."	17-18, 21-24, 29, 30
"Time to feed the horses now."	19
"I'm tired."	21, 22, 24, 29
"Let's play farm."	21, 29
"Okay."	29
"You were hungry."	21, 24, 27-29
"Yeah, I like playing farm."	21
"This was fun."	21-23
"Put the animals in."	24, 28
"Time to clean the stables."	27-30
"I will clean the cow area."	27, 30
"I will clean the pig area."	28

5.3.1.1.2 ***Esther's unscripted behaviours for the farm play set***

The rate of Esther's unscripted play actions and verbalizations for the farm play set are shown in Figure 14.

Figure 14. Esther's unscripted play actions and verbalizations for the farm play set



Following the introduction of the point-of-view video modelling intervention (session 6), Esther's *unscripted play actions* increased from a mean baseline level of 0 (range 0-2) to a mean level of 2 (range 0-4). She demonstrated unscripted play actions in 21 out of the 31 sessions she participated in, which equates to about 68% of sessions. She demonstrated the highest number of unscripted verbalizations in sessions 15, 16 and 24 (N=4, 4, and 5 respectively). In looking at Figure 14, following baseline, Esther continued to increase the amount of unscripted actions she demonstrated. On the last session that she participated in prior to the follow-up session, Esther demonstrated three unscripted actions, which is higher than the average mean throughout the intervention. At the follow-up session, which took place three weeks after the intervention ended, she only demonstrated one unscripted action.

Table 16. Esther's unscripted play actions for the farm play set

Unscripted Play Actions	***Session(s)***
Walked a horse along the table	2, 13
Walked the cow along the table	26
Placed the hay on the wheelbarrow	8-10, 13, 15, 17, 18, 19, 23, 24
Opened the door to the pig area	11, 13, 22
Opened the door to the cow area	29, 30
Stood character next to the wheelbarrow without moving the wheelbarrow along	14
Walked a character on the table	15, 28
Drove the tractor on the table	16
Slid the doors on the side of the barn that cover pictures of animals	16, 18, 24, 25, 29

Placed the goat by the bucket	18
Brought the goat to the hay	24
Placed a horse in the barn	24, 30
Took the goat out of the barn	25
Lifted the door to the silo	22
Put down the door to the silo	22
Stood a character up that was lying down, followed by the verbalization "there"	24
Moved the wheelbarrow along with a character on it	32

Esther's *unscripted verbalizations* increased from a mean baseline level of 0 (range 0) to a mean level of 1 (range 0-6), following the introduction of the point-of-view video modelling intervention (session 6). She demonstrated unscripted verbalizations in 5 out of the 31 sessions she participated in, which equates to about 16% of sessions. She demonstrated the highest number of unscripted verbalizations in sessions 29 and 30 (N=6 and 5 respectively). In looking at Figure 14, although Esther increased in her unscripted verbalizations, interestingly, they were only demonstrated within sessions 24-30. On the last session that she participated in prior to the follow-up session, Esther demonstrated five unscripted actions, which is higher than the average mean throughout the intervention. At the follow-up session, which took place three weeks after the intervention ended, she did not demonstrate any unscripted verbalizations.

Table 17. Esther's unscripted verbalizations for the farm play set

Unscripted Verbalizations	***Session(s)***
"Clean the…area."	24
"There."	24
"Let the animals in."	25
"Put the animals in."	28
"Okay."	29
"Sleep now."	29, 30
"Come on."	29, 30
"I will."	29
"All right."	30
"Animals in."	30

5.3.1.1.3 *Esther's qualitative findings for the farm play set*

After reviewing the videos and their transcriptions for all sessions involved with the farm play set, several observations can be made about Esther's social behaviours. Esther demonstrated quite a range of scripted actions and scripted verbalizations after the introduction of the point-of-view video modelling. It should be pointed out that she did not display any scripted actions or verbalizations during the baseline phase. From the

introduction of the video (session 6) onward, Esther continued to increase the number of scripted actions and verbalizations as well as unscripted actions. She did increase unscripted verbalizations towards the latter end of the intervention phase (sessions 24, 25, 28, 29, and 30).

Esther demonstrated exploration in her play. This could be seen when she brought the girl character close to look at, then turned it side to side in her hands (session 3), or when she moved the arms of the male character (session 5). She also picked up the hay from the wheelbarrow, looked at the place where it was previously, then placed it back in its place (session 6). She demonstrated more interaction with the toys, such as swinging the bucket by its handle (session 8).

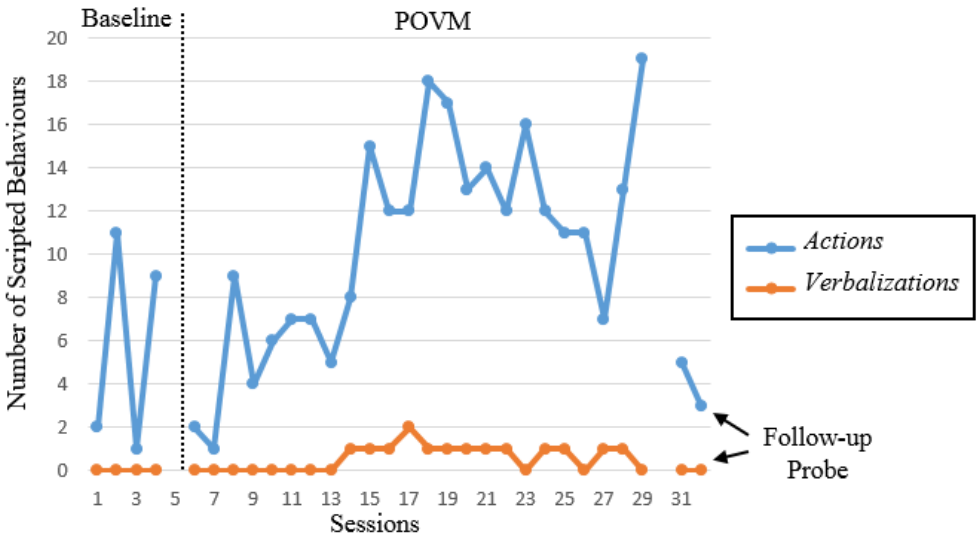
Esther demonstrated an awareness of the association or relationship between the objects she was playing with and the video she watched. For example, in session 10 as she placed the hay on the blue wheelbarrow, she glanced at the computer. Another example could be seen in session 14 when she began to sing the "do-do" jingle of the farmer, as heard in the video, when she looked at a peer holding the farmer. And further, in session 22, after acting out part of the end of the script ("I'm tired…let's go to sleep now…come on, good night…this was fun"), she smiled while she glanced over to the computer.

5.3.1.2 ***Group 2, Participant 2 – Liam***

5.3.1.2.1 ***Liam's scripted behaviours for the farm play set***

The rate of Liam's scripted play actions and verbalizations for the farm play set are shown in Figure 15.

Figure 15. Liam's scripted play actions and verbalizations for the farm play set



Following the introduction of the point-of-view video modelling intervention (session 6), Liam's *scripted play actions* doubled from a mean baseline level of 5 (range 1-11) to a mean level of 10 (range 1-18). He demonstrated scripted play actions in all sessions he participated in (30 of 32 sessions). He demonstrated the highest number of scripted actions in sessions 15, 18, 19, 23 and 29 (N=15, 18, 17, 16 and 19 respectively). In looking at Figure 15, one can see Liam's scripted play actions increase quite dramatically following the introduction of the point-of-view video. On the last session that he participated in prior to the follow-up session, Liam demonstrated five scripted actions. At the follow-up session, which took place three weeks after the intervention ended, he only demonstrated three scripted actions.

Table 18. Liam's scripted play actions for the farm play set

Scripted Play Actions	***Session(s)***
Slid the rooster back and forth	1-4, 6, 9, 11, 13-21, 25-29
Took a cow out of the cow area	2, 4, 8-13, 17-29, 31
Walked the cow on the table	2, 8
Put a cow back in the cow area	2, 4, 8, 10-13, 15-24, 28, 29
Closed the doors to the cow area	4, 8, 10-23, 26, 28, 29, 31
Closed the door to the pig area	4, 6, 10-11, 12, 14-16, 19-20, 23-29
Removed the pig from the pig area	4, 16-19, 22, 24, 27-29, 32

Returned the pig to the pig area	4, 19, 10, 12, 15, 16, 20, 21, 23-29
Took the sheep out of his area	8, 9, 19, 25, 29
Placed a character in the upstairs of the barn lying down	15, 18-27
Moved the farmer along with the blue wheelbarrow	16, 21, 26
Dumped the hay from the wheelbarrow	16, 21
Moved a character to clean the stable	21-23, 25, 26, 29, 31
Placed the pig in front of the bucket	29, 32
Placed horses in front of the hay	31

Liam's *scripted verbalizations* increased slightly from a mean baseline level of 0 (range 0) to a mean level of 1 (range (0-1) following the introduction of the point-of-view video (session 6). Liam demonstrated scripted verbalizations in 13 out of the 30 sessions he participated in, which equates to about 43% of sessions. He demonstrated the highest number of scripted verbalizations in session 17 (N=2). In all other sessions in which he demonstrated a scripted verbalization, he only made one (N=1). In looking at Figure 15, although minimal, his scripted verbalizations were clearly demonstrated following the introduction of the point-of-view video. It should be noted however that Liam's scripted verbalizations, although demonstrated over 13 sessions, were limited to one verbalization, which was a verbal approximation of the "cock-a-doodle-doo" (see Table 19 below). His level of verbalizations are commensurate with what his teacher shared at the beginning of the intervention. As noted in the methods chapter for this school (see chapter 3, §3.5.3.1), Liam mainly used single words to communicate and was beginning to use two words together. He also used several speech sound substitutions which could affect intelligibility of his speech. On the last session that he participated in prior to the follow-up session, Liam demonstrated three scripted verbalizations, which is higher than the average mean throughout the intervention. At the follow-up session, which took place three weeks after the intervention ended, he did not demonstrate any scripted verbalizations.

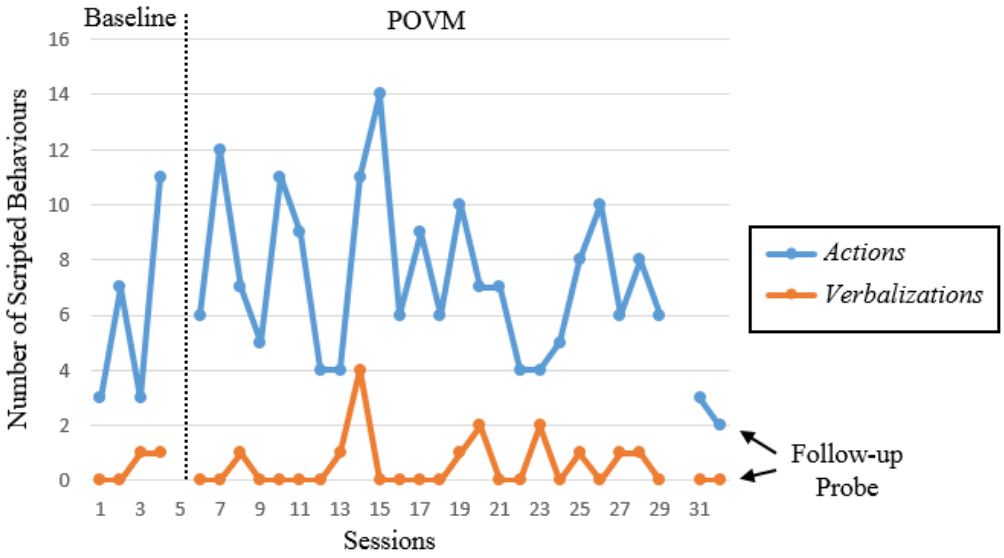
Table 19. Liam's scripted verbalizations for the farm play set

Scripted Verbalizations	***Session(s)***
Verbal approximation of "cock-a-doodle-doo."	14-21, 24-25, 27-28

5.3.1.2.2 ***Liam's unscripted behaviours for the farm play set***

The rate of Liam's unscripted play actions and verbalizations for the farm play set are shown in Figure 16.

Figure 16. Liam's unscripted play actions and verbalizations for the farm play set



Following the introduction of the point-of-view video modelling intervention (session 6), Liam's *unscripted play actions* increased from a mean baseline level of 5 (range 3-11) to a mean level of 7 (range 3-14). Liam demonstrated unscripted actions in all sessions he participated in (30 of the 32 sessions). He demonstrated the highest number of unscripted play actions in sessions 4, 7, 10, 14 and 15 (N=11, 12, 11, 11 and 14 respectively). In looking at Figure 16, one can see a steady amount of unscripted play actions displayed throughout all phases (baseline and intervention). On the last session that he participated in prior to the follow-up session, Liam demonstrated three unscripted play actions. At the follow-up session, which took place three weeks after the intervention ended, he only demonstrated two unscripted play actions.

Table 20. Liam's unscripted play actions for the farm play set

Unscripted Play Actions	***Session(s)***
Put horses in the cow area of the barn	14
Put the sheep in the pig and cow areas	15
Removed the cows from the cow area	13, 17-29, 31
Parked the tractor inside the barn and closed the doors	13-15, 17-20, 31

Liam's *unscripted verbalizations* slightly increased from a mean baseline level of 0 (range 0-1) to a mean level of 1 (range 0-4), following the introduction of the point-of-view video modelling intervention (session 6). He demonstrated unscripted verbalizations in 11 out of 30 sessions, which equates to about 37% of sessions. He demonstrated the highest number of unscripted verbalizations in sessions 14, 20 and 23 (N=4, 2 and 2

respectively). In the remaining sessions, he only demonstrated one unscripted verbalization in each session. Liam's level of unscripted verbalizations are commensurate with his current communication level (see chapter 3, §3.5.3.1). In looking at Figure 16, one can see a small number of unscripted verbalizations across all phases of the intervention (baseline and intervention). On the last session that he participated in prior to the follow-up session, Liam did not demonstrate any unscripted verbalizations. Similarly, at the follow-up session, which took place three weeks after the intervention ended, he did not demonstrate any unscripted verbalizations.

Table 21. Liam's unscripted verbalizations for the farm play set

Unscripted Verbalizations	***Session(s)***
"Ee-i-ee-i-o."	3, 4
"Thank you."	8
"Hey, stop it!"	13, 14, 19, 28
"Hey!"	19, 23, 27

5.3.1.2.3 ***Liam's qualitative findings for the farm play set***

After reviewing the videos and their transcriptions for all sessions involved with the farm play set, several observations can be made about Liam's social behaviours. Liam was active in his play with the farm set. At times he would stand while playing. He would also lean closer to objects he was interested in. He would often pull the farm from the middle of the table closer to him. He would also turn the farm around to access both the front and the back portion of the farm building. Interestingly he would also right objects. For example in session 3, he would stand up objects and animals that were laying down on the table. Additionally, he would right the animals in the barn that tipped over (session 19). He was the only participant who parked the tractor in the barn itself (sessions 13-15, 17-20 and 31). This was not observed in the video and showed some imagination on his part. He would often clear out any animals from inside the barn before placing the tractor inside it and closing the doors.

Liam demonstrated the most significant increase in his scripted play actions throughout the experiment. He demonstrated targeted play behaviours in every session he attended. From the introduction of the video (session 6) onward, Liam continued to increase the number of scripted actions at a higher rate than unscripted actions.

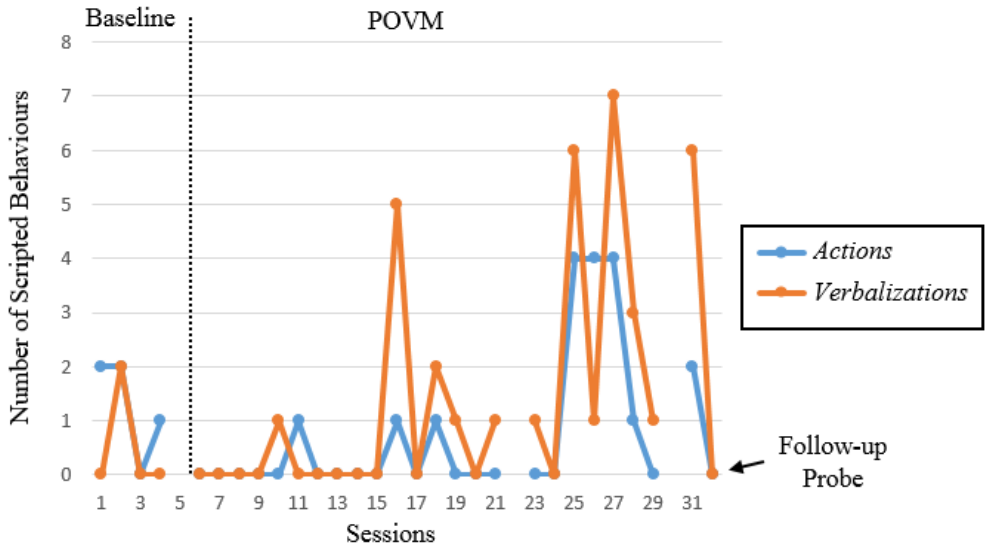
He demonstrated unscripted verbalizations at a slightly higher rate (range 0-4) than that of scripted verbalizations (range 0-1).

5.3.1.3 **Group 2, Participant 3 – Joseph**

5.3.1.3.1 ***Joseph's scripted behaviours for the farm play set***

The rate of Joseph's scripted play actions and verbalizations for the farm play set are shown in Figure 17.

Figure 17. Joseph's scripted play actions and verbalizations for the farm play set



Following the introduction of the point-of-view video modelling intervention (session 6), Joseph's *scripted play actions* increased slightly from a mean baseline level of 1 (range 0-2) to a mean level of 1 (range 0-4). Joseph demonstrated scripted play actions in 11 out of the 29 sessions he participated in, which equates to about 38% of sessions. It should be noted that Joseph missed three sessions, therefore only participating in 29 out of the 32 sessions involving the farm play set. He demonstrated the highest number of scripted play actions in sessions 25, 26 and 27 (N=4 in each session). In looking at Figure 17, one can see minimal increases in his scripted actions with the exception of sessions 25-27, in which he demonstrated 4 scripted actions in each session. On the last session that he participated in prior to the follow-up session, Joseph demonstrated 2 scripted actions, which is slightly higher than the average mean throughout the intervention. At the follow-up session, which took place three weeks after the intervention ended, he did not demonstrate any scripted play actions.

Table 22. Joseph's scripted play actions for the farm play set

Scripted Play Actions	***Session(s)***
Slid the rooster back and forth	1, 2, 4, 16, 26-28, 31
Placed a character in the upstairs of the barn lying down	11, 26
Moved the farmer along with the blue wheelbarrow	18, 25-27
Dumped out the hay from the wheelbarrow	25, 27
Closed the door to the pig area	26, 31

Joseph's *scripted verbalizations* increased from a mean baseline level of 0 (range 0-2) to a mean level of 1 (range 0-7), following the introduction of the point-of-view video modelling intervention (session 6). He demonstrated targeted scripted verbalizations in 13 of the 32 sessions, which equates to about 40% of total sessions. He demonstrated the highest number of scripted verbalizations in sessions 15, 25, 27 and 31 (N=5, 6, 7 and 6 respectively). In looking at Figure 17, one can see an increase in his scripted verbalizations in sessions 25-31. Prior to these sessions, he demonstrated a minimal amount of scripted verbalizations. On the last session that he participated in prior to the follow-up session, Joseph demonstrated six scripted verbalizations, which is higher than the average mean throughout the intervention. At the follow-up session, which took place three weeks after the intervention ended, he did not demonstrate any scripted verbalizations.

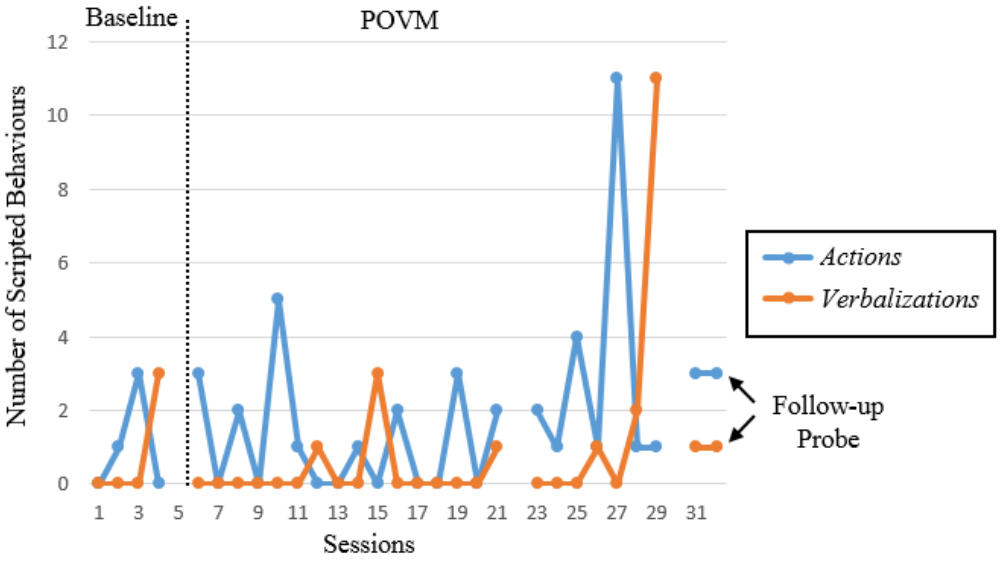
Table 23. Joseph's scripted verbalizations for the farm play set

Scripted Verbalizations	***Session(s)***
"Cock-a-doodle-doo."	2, 16, 28, 31, 32
"I'll be the farmer."	10
Sang the "do-do" jingle.	16, 18, 19, 21, 23, 25-28, 31
"Let's get some sleep now."	29
"I'll clean the cow area."	31
"Oink, oink."	31
"I like playing farm."	16
"Me too."	16

5.3.1.3.2 ***Joseph's unscripted behaviours for the farm play set***

The rate of Joseph's unscripted play actions and verbalizations for the farm play set are shown in Figure 18.

Figure 18. Joseph's unscripted play actions and verbalizations for the farm play set



Following the introduction of the point-of-view video modelling intervention (session 6), Joseph's *unscripted play actions* increased from a mean baseline level of 1 (range 0-3) to a mean level of 2 (range 0-11). Joseph demonstrated unscripted actions in 19 of the 29 sessions, which equates to about 66% of the total sessions. He demonstrated the highest number of unscripted play actions in sessions 10, 25 and 27 (N=5, 4 and 11 respectively). In looking at Figure 18, one can see a stable range of unscripted play actions throughout the intervention (range 0-5), with the exception of a spike in session 27 (N=11). On the last session that he participated in prior to the follow-up session, Joseph demonstrated three unscripted actions, which is slightly higher than the average mean throughout the intervention. At the follow-up session, which took place three weeks after the intervention ended, he also demonstrated three unscripted play actions.

Table 24. Joseph's unscripted play actions for the farm play set

Unscripted Play Actions	***Session(s)***
Raised the door to the silo	3, 10
Lowered the door to the silo	3, 10
Walked the horse on the table	6, 10, 21, 27, 32
Drove the tractor on the table	6, 10, 11
Moved the wheelbarrow either without the hay in it, without a character or with the character on top of it	8, 14, 16, 19, 21, 22, 25, 27
Placed the hay on the wheelbarrow	19, 26, 27
Walked a character on the table	25, 27, 32
Walked the dog on the table	27
Stood a character on top of a horse	27
Placed a character in the farm (not modelled in the video)	28, 31
Laid character on the table while saying 'time to sleep'	29
Slid the doors covering animal pictures on the side of the barn	31

Joseph's *unscripted verbalizations* increased slightly from a mean baseline level of 1 (range 0-3) to a mean level of 1 (range 0-11), following the introduction of the point-of-view video modelling intervention (session 6). Unscripted verbalizations were demonstrated in only 9 out of the 29 sessions he participated in, which equates to about 31% of sessions. He demonstrated the highest number of unscripted verbalizations in sessions 4, 15 and 29 (N=3, 3 and 11 respectively). In looking at Figure 18, one can see minimal unscripted verbalizations throughout the intervention (range 0-2), with the exception of a spike in session 29 (N=11). On the last session that he participated in prior to the follow-up session, Joseph demonstrated one unscripted verbalization, which is slightly higher than the average mean throughout the intervention. At the follow-up session, which took place three weeks after the intervention ended, he also demonstrated one unscripted verbalization.

Table 25. Joseph's unscripted verbalizations for the farm play set

Unscripted Verbalizations	***Session(s)***
"Ee-i-ee-i-o."	4
"I've got them both."	4
"Feed the animals."	12
"All done playing."	15
"I not playing."	15
"I finished."	15
"Hey…yah" while walking the horse on the table	21
"Whee!"	26
"Find the bucket."	28
"I like find the bucket."	28
"I'm making a triangle."	29
"I made a triangle."	29
"Look Lisa, I made a triangle."	29
"I'll make a horse."	29
"Make it here."	29
"And there."	29
"There."	29
"Sleepy time I know."	29
"Let's go to sleep then."	29
"Wake up."	29
"You finished."	31
"I'm playing Angela."	31

5.3.1.3.3 *Joseph's qualitative findings for the farm play set*

Joseph demonstrated minimal increases in targeted scripted actions and scripted verbalizations after the introduction of the point-of-view video modelling. Joseph demonstrated a higher level of scripted verbalizations than scripted actions.

He also demonstrated some repetition of phrases stated by his peers. For example, in session 4, a peer commented on the shape the fence was made into by saying "it looks like a diamond". Joseph then stated "looks like a diamond". Joseph was also observed imitating the actions of his peers. For example, after a peer flew the dog into the air saying, "Whee!" Joseph proceeded to fly a man in the air saying, "Whee!"

At times, Joseph gathered several items in a group to hold in his hands or lap. For example, in session 7, he gathered three characters and held them in his hands on his lap. He sat one character on the table and picked up another in its place, then returned the group to his lap. He then put the characters in a pile on the table, then returned them to his lap. In some sessions, (session 9 for example) Joseph would pick up the interlocking fence and bend the pieces until they separated. As a piece would fall, he would pick it up and place the pieces in a stack in his hands. He would then shuffle them and adjust them in a stack in his hands. He would repeatedly shuffle the stack in his hands. When this occurred, he was prompted to release the fence pieces. They would then be placed away or under the table, to allow Joseph to focus on other toys to play with.

He did demonstrate some sensory-related behaviours such as hand stereotypy (hand flapping), leaning in close to smell his peer's hair (sessions 6 and 10) and to touch a peer's hair (session 18). At times he would also mouth objects (session 7).

5.3.2 ***Group 2 Town Play Set Results***

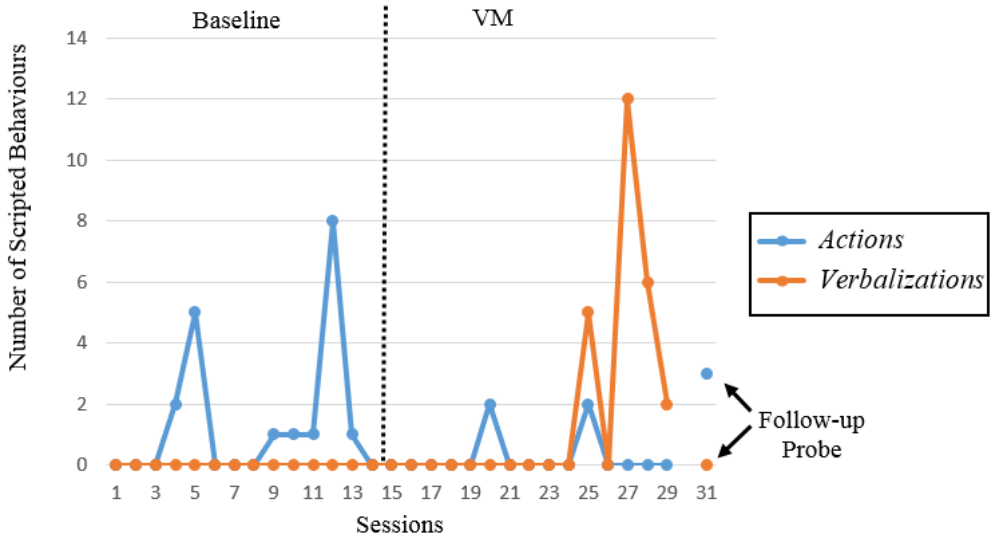
This group was shown the video of mainstream peers playing with the town play set which was filmed from the third-person perspective—video modelling (VM). See §3.12.1 for a picture of the town play set and a listing of the toys available to play with.

5.3.2.1 **Group 2, Participant 1 – Esther**

5.3.2.1.1 ***Esther's scripted behaviours for the town play set***

The rate of Esther's scripted play actions and verbalizations for the town play set are shown in Figure 19.

Figure 19. Esther's scripted play actions and verbalizations for the town play set



Following the introduction of the video modelling intervention in session 15, Esther's *scripted play actions* decreased from a mean baseline level of 1 (range 0-8) to a mean level of 0 (range 0-3) following the introduction of video modelling. She demonstrated scripted play actions in 10 of the 30 sessions she participated in. It should be noted that Esther missed one of the sessions, thus participating in 30 of the 31 sessions involving the town play set. She demonstrated the highest number of scripted play actions in sessions 5 and 12 (N=5 and 8 respectively). In looking at Figure 19, one can see that her level of targeted scripted actions did not increase after the introduction of the video modelling, but rather decreased. On the last session that she participated in prior to the follow-up session, Esther did not demonstrate any scripted actions. At the follow-up session, which took place three weeks after the intervention ended, she demonstrated three scripted play actions.

Table 26. Esther's scripted play actions for the town play set

Scripted Play Actions	***Session(s)***
Placed the mum character inside the post office	4
Rang the cash register in the post office	4

Opened the door to the tea shop	5
Stood a character in the balcony of the tea shop	5, 21, 26, 32
Placed a character in the entry of the tea shop	5
Placed a character in the back portion of the tea shop	5, 9
Opened the door to the toy shop	11-13
Placed a character inside the toy shop	10, 12
Took a character out of the toy shop	12
Moved the mum character downstairs in the tea shop	21

Esther's *scripted verbalizations* increased from a mean baseline level of 0 (range 0) to a mean level of 2 (range 0-12), following the introduction of the video modelling intervention in session 15. Esther demonstrated scripted verbalizations in 4 out of the 30 sessions she participated in (sessions 25-29, N=5, 12, 6 and 2 respectively). In looking at Figure 19, one can see an increase in her scripted verbalizations only during sessions 25-29. On the last session that she participated in prior to the follow-up session, Esther demonstrated 2 scripted verbalizations. At the follow-up session, which took place three weeks after the intervention ended, she did not demonstrate any scripted verbalizations.

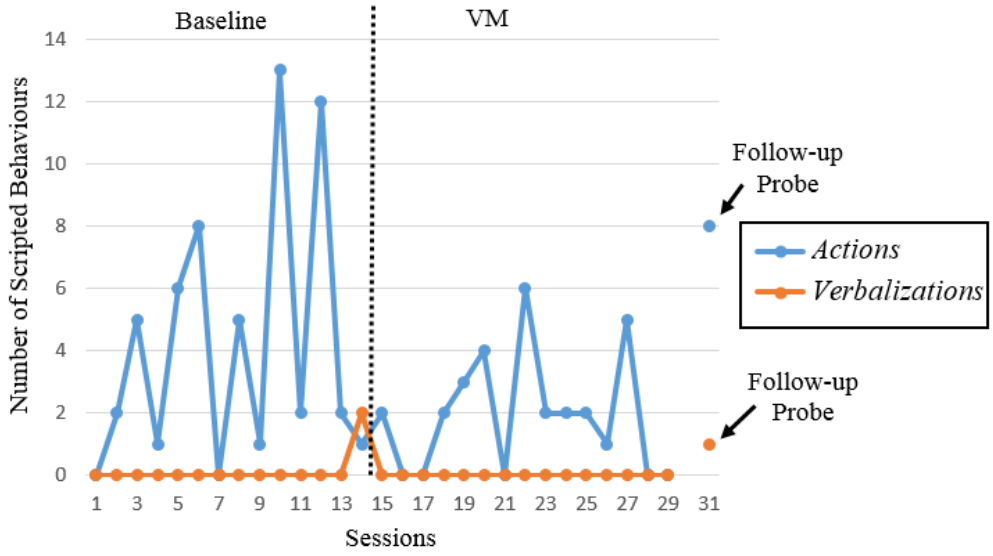
Table 27. Esther's scripted verbalizations for the town play set

Scripted Verbalizations	***Session(s)***
"Let's play town."	26, 28, 29
"Okay."	26, 28. 29
"I'll be the mum."	26, 28
"I'll be the boy."	26, 28, 29
"I'll be the postal worker."	26, 28, 29
"Walk, walk."	30
"Out the door."	30

5.3.2.1.2 ***Esther's unscripted behaviours for the town play set***

The rate of Esther's unscripted play actions and verbalizations for the town play set are shown in Figure 20.

Figure 20. Esther's unscripted play actions and verbalizations for the town play set



Following the introduction of the video modelling intervention in session 15, Esther's *unscripted play actions* decreased from a mean baseline level of 4 (range 0-13) to a mean level of 2 (range 0-8) following the introduction of video modelling. Esther demonstrated unscripted play actions in 23 of the 30 sessions she participated in, which equates to about 77% of sessions. She demonstrated the highest number of unscripted play actions in sessions 6, 10, 12 and 31 (N=8, 13, 12 and 8 respectively). In looking at Figure 20, one can see that her unscripted play actions were quite variable, with the largest range seen in sessions 1-14. In sessions 16 through 29, a decrease in her play actions is evident. On the last session that she participated in prior to the follow-up session, Esther did not demonstrate any unscripted play actions. At the follow-up session, which took place three weeks after the intervention ended, she demonstrated eight unscripted play actions.

Table 28. Esther's unscripted play actions for the town play set

Unscripted Play Actions	***Session(s)***
Placed a character in the phone booth and rang the phone	2
Walked characters on the table	3, 9
Opened the door to the police station	3, 10, 12, 19, 22, 27, 28
Closed the door to the police station	10, 12, 13, 19, 22, 28
Placed a character in the police station	3, 6, 10, 12, 14, 15, 22
Pushed button for phone in police station with a character there	12
Used a character to push the welcome mat in the post office	4
Placed a character in the white motorcar	5, 6, 8, 20, 22, 24, 25, 32
Drove the motorcycle (or motorcar) with a character other than	5, 6, 8, 22, 24, 25,

the policeman (or policewoman)	32
Rang the cash register in the tea house without a character there	5
Rang the phone in the tea house without a character there	5, 21
Placed a character in the upstairs inner room of the tea shop	11, 32
Rang the phone in the toy shop without a character there	1, 10, 12
Closed the door to the toy shop	12, 13

Esther's unscripted verbalizations decreased slightly from a mean baseline level of 0 (range 0-2) to a mean level of 0 (range 0-1), following the introduction of the video modelling intervention in session 15. Esther demonstrated unscripted verbalizations on two occasions (sessions 14 and 31, N=2 and 1 respectively). Please refer to Table 29 for a listing of her unscripted verbalizations. As can be seen in Figure 20, on the last session that she participated in prior to the follow-up session, Esther did not demonstrate any unscripted verbalizations. At the follow-up session, which took place three weeks after the intervention ended, she demonstrated one unscripted verbalization.

Table 29. Esther's unscripted verbalizations for the town play set

Unscripted Verbalizations	***Session(s)***
"Hello."	14
"Nice to meet you."	14
"Come in there."	31

5.3.2.1.3 ***Esther's qualitative findings for the town play set***

The results for the town play set are in contrast with the results of the farm play set. Following the introduction of the video modelling intervention in which the video was filmed from the third-person perspective, Esther's level of targeted scripted actions did not increase after the introduction of the video, but rather decreased. She demonstrated a higher level of unscripted actions than scripted actions with the town play set.

Interestingly, her unscripted play actions were quite variable, with the largest range seen in sessions 1-14 prior to the introduction of the video. Referring back to Figure 20, following the introduction of the video filmed from the third-person perspective, (sessions 16 through 29) one can see a large decrease in her unscripted play actions. It cannot be said that this is attributable to her increasing her scripted play actions, as those decreased as well. One possibility could be that the video filmed from the third-person perspective or the town play set itself was not as interesting to Esther as the farm play set.

Similar to her play behaviours with the farm play set, Esther demonstrated some exploration in her play with the town play set. This could be seen when she brought characters close to look at, then turned them side to side in her hands (sessions 1 and 2). She did place characters within the buildings of the town, such as placing the girl in the police station (session 3), placing the mum in the post office (session 4) and standing the mum in the balcony of the tea shop (session 5). She also demonstrated some awareness of 'character as agent' when she pushed the phone button in the police station with a character there (session 12) and used a character to push the welcome mat in the post office (session 4).

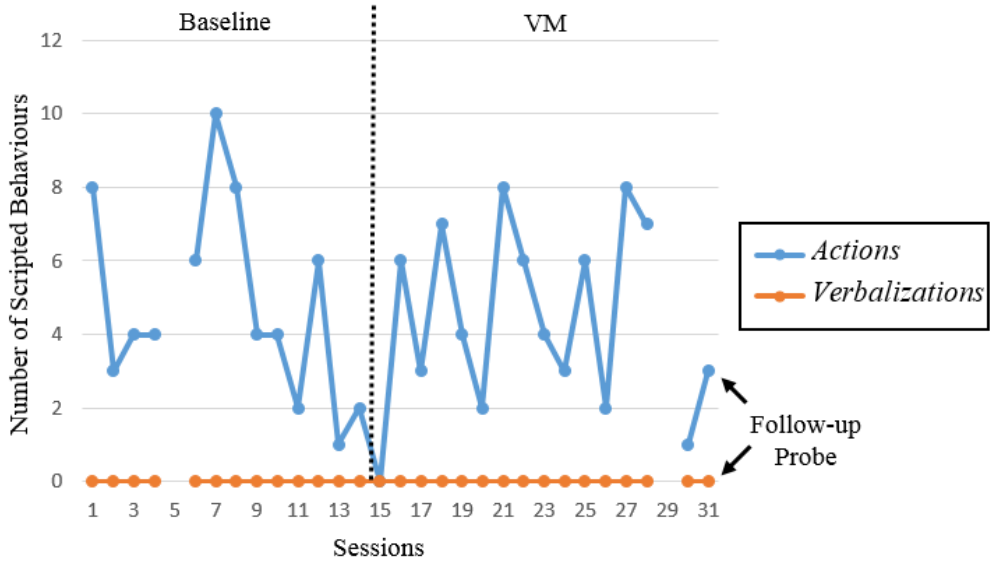
In referring back to Figure 20, one can see an increase in her scripted verbalizations only during sessions 25-29. She demonstrated a range of scripted verbalizations (range 0-12), however, they were limited to the same phrases (see Table 27). For example in session 25, she stated the first five statements from the video, "Let's Play Town. Okay. I'll be the mum. I'll be the boy. I'll be the postal worker." In session 27, she repeated these five phrases in sequence on two occasions during the play session, thus accounting for 10 of the 12 scripted verbalizations in that session. Similarly, in session 28, she also repeated these first five phrases.

5.3.2.2 **Group 2, Participant 2 – Liam**

5.3.2.2.1 ***Liam's scripted behaviours for the town play set***

The rate of Liam's scripted play actions and verbalizations for the town play set are shown in Figure 21.

Figure 21. Liam's scripted play actions and verbalizations for the town play set



Following the introduction of the video modelling intervention in session 15, Liam's *scripted play actions* decreased slightly from a mean baseline level of 4 (range 0-10) to a mean level of 4 (range 0-8). Liam demonstrated a moderate steady increase in targeted scripted actions after the introduction of the video modelling. He demonstrated targeted scripted actions in 28 out of the 29 sessions he participated in, which equates to about 97% of sessions. It should be noted that he missed two sessions involving the town play set, therefore he participated in 29 out of 31 sessions. He demonstrated the highest number of scripted play actions in sessions 1, 7, 8, 21 and 27 (N=8, 10, 8, 8 and 8 respectively). In looking at Figure 21, one can see that Liam demonstrated scripted play actions during the baseline phase, however they continued to decrease over time. However, following the introduction of the video modelling in session 15, his scripted play actions began to increase throughout the remainder of the intervention phase. On the last session that he participated in prior to the follow-up session, Liam only demonstrated one scripted action. At the follow-up session, which took place three weeks after the intervention ended, he demonstrated three scripted play actions.

Table 30. Liam's scripted play actions for the town play set

Scripted Play Actions	***Session(s)***
Opened the door to the toy shop	1, 9, 10, 12, 19, 21, 22
Placed a character in the toy shop	1, 16, 21-23, 25, 27, 30
Rang the welcome mat of the toy shop with a character there	1, 23
Brought a character out of the toy shop	27

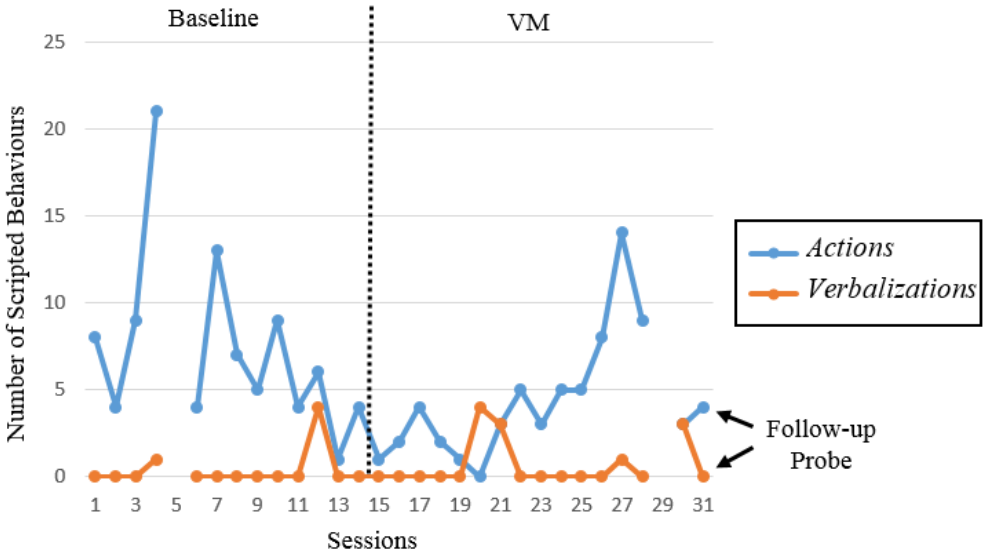
Placed a character in the post office	1, 3, 4, 6, 19, 22, 24, 25, 28
Brought a character out of the post office	25
Rang the cash register in the post office with a character there	3, 19, 22, 24, 25
Walked characters towards the tea shop	28
Opened the door to the tea room	7, 8, 14, 16
Placed a character in the upstairs of the tea room	1, 7-10, 18, 23, 27
Placed character by the register in the tea room	16, 18, 20
Closed the door to the tea room	8, 14, 16
Drove the motorcycle with the policeman or policewoman in it	2-4, 6-14, 16-17, 20-22, 24, 26-28, 31

Liam's *scripted verbalizations* remained the same from baseline throughout intervention at a mean level of 0 (range 0), following the introduction of the video modelling intervention in session 15. He did not demonstrate any scripted verbalizations.

5.3.2.2.2 ***Liam's unscripted behaviours for the town play set***

The rate of Liam's unscripted play actions and verbalizations for the town play set are shown in Figure 22.

Figure 22. Liam's unscripted play actions and verbalizations for the town play set



Following the introduction of the video modelling intervention in session 15, Liam's *unscripted play actions* decreased from a mean baseline level of 7 (range 1-21) to a mean level of 4 (range 0-14) following the introduction of video modelling. He demonstrated unscripted play actions in 28 out of the 29 sessions he participated in, which equates to about 97% of sessions. He demonstrated the highest number of unscripted play actions in sessions 3, 4, 7, 27 and 28 (N=9, 21, 13, 14 and 9 respectively). In looking at Figure 22,

one can see that after an initial jump in the beginning of the baseline phase (session 4), from session 7-20 there was a steady decline in his unscripted play actions, followed by an increase again over sessions 21 through 27. On the last session that he participated in prior to the follow-up session, Liam demonstrated three unscripted play actions, which was lower than the average mean throughout the intervention. At the follow-up session, which took place three weeks after the intervention ended, he demonstrated four scripted play actions.

Table 31. Liam's unscripted play actions for the town play set

Unscripted Play Actions	***Session(s)***
Placed a character in the police station	1, 2, 4, 6, 7, 12, 26-28
Opened the door to the police station	2, 4, 7-8, 14, 27, 28
Placed a character in the police station on the welcome mat	7, 8
Rang the phone in the police station with a character there	12
Closed the door to the police station	1, 4, 27, 28
Took a character out of the police station	27
Rang the welcome mat of the post office with a character there	1, 3, 7, 12, 19, 24
Rang the phone in the post office with a character there	4, 24, 25, 26
Placed a character in the motorcycle or motorcar	2-4, 6-15, 17, 22, 24, 26-28, 31
Drove the motorcar without a character in it	6, 10
Placed a character in the phone booth (without ringing phone)	1, 18
Rang the phone in the phone booth with a character inside	1, 8-11, 18, 23, 30
Placed a character on the welcome mat in the tea room to ring it	7, 9
Walked the policeman out of the police station	7
Lined up buildings (to drive motorcycle in front of them)	7. 9, 10
Closed the door to the toy shop	19, 22, 25
Rang the phone in the toy shop with a character there	16, 23, 30
Rang the cash register in the toy shop with a character	16, 21, 27
Placed the toy display in the window of the toy shop	21, 25
Walked a character on the table (not modelled)	27

Liam's *unscripted verbalizations* decreased slightly from a mean baseline level of 0 (range 0-4) to a mean level of 0 (range 0-3), following the introduction of the video modelling intervention in session 15. He demonstrated unscripted verbalizations in 6 out of the 29 sessions, which equates to about 21% of sessions. He demonstrated the highest number of unscripted verbalizations in sessions 12, 20, 21 and 30 (N=4, 4, 3 and 3 respectively). In looking at Table 32 one can see that Liam's unscripted verbalizations are minimal and do not reflect any sort of pattern.

Table 32. Liam's unscripted verbalizations for the town play set

Unscripted Verbalizations	***Session(s)***
"Aah, stop it!"	4
"Hey, stop it!"	12
"Hey!"	4, 12, 20, 27
"Oh, no broken!"	30
"Broken."	30

5.3.2.2.3 *Liam's qualitative findings for the town play set*

Liam's results for the town play set are in contrast with the results of the farm play set. Following the introduction of the video modelling intervention in which the video was filmed from the third-person perspective, Liam's level of targeted scripted actions increased, yet variably (see Figure 22). This is in contrast to how his scripted play actions increased quite dramatically following the introduction of the point-of-view video filmed from the first-person perspective for the farm play set (see Figure 15 in §5.3.1.2.1).

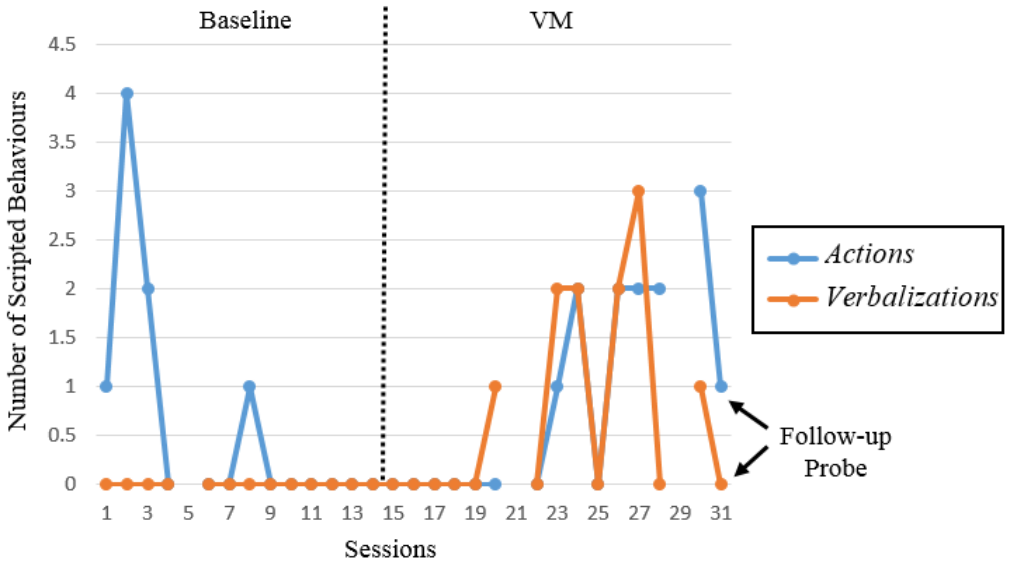
With the town play set, Liam demonstrated a moderate steady increase in targeted scripted actions after the introduction of the video modelling. Interestingly it appeared that the number of unscripted actions Liam demonstrated within sessions appeared to decrease as he increased the number of scripted actions that he imitated. He did not demonstrate any scripted verbalizations and he only demonstrated a minimal amount of unscripted verbalizations.

5.3.2.3 **Group 2, Participant 3 – Joseph**

5.3.2.3.1 *Joseph's scripted behaviours for the town play set*

The rate of Joseph's scripted play actions and verbalizations for the town play set are shown in Figure 23.

Figure 23. Joseph's scripted play actions and verbalizations for the town play set



Following the introduction of the video modelling intervention in session 15, Joseph's *scripted play actions* increased from a mean baseline level of 0 (range 0-4) to a mean level of 1 (range 0-4). Joseph demonstrated very minimal increases in targeted scripted actions after the introduction of the video modelling. Joseph demonstrated scripted play actions in 10 out of the 29 sessions he participated in, which equates to about 35% of sessions. He demonstrated the highest number of scripted play actions in sessions 2 and 30 (N=4 and 3 respectively). In looking at Figure 23, one can see that following the introduction of the video in session 15, Joseph's scripted play actions increased in sessions 23-31. On the last session that he participated in prior to the follow-up session, Joseph demonstrated three scripted actions, which was at a higher level than the average mean throughout the intervention. At the follow-up session, which took place three weeks after the intervention ended, he only demonstrated one scripted play action.

Table 33. Joseph's scripted play actions for the town play set

Scripted Play Actions	***Session(s)***
Walked a character towards the toy shop	30, 31
Opened the door to the toy shop	1, 8, 28, 30
Placed a character in the toy shop	2, 3
Rang the welcome mat in the toy shop with a character there	2, 28, 30
Placed a character in the post office	2
Drove the motorcycle or motorcar with the policeman or policewoman in it	24, 27

Joseph's *scripted verbalizations* increased from a mean baseline level of 0 (range 0) to a mean level of 1 (range 0-5), following the introduction of the video modelling intervention in session 15. Joseph demonstrated very minimal increases in targeted scripted verbalizations after the introduction of the video modelling. Scripted verbalizations were only demonstrated in 6 of the 29 sessions he participated in, which equates to about 21% of the total sessions. He demonstrated the highest number of scripted verbalizations in sessions 23, 24, 26 and 27 (N=2, 2, 2 and 3 respectively). In looking at Figure 23, one can see that Joseph did not demonstrate any scripted verbalizations during the baseline phase. He did demonstrate minimal increases in his scripted verbalizations from session 20-30. On the last session that he participated in prior to the follow-up session, Joseph demonstrated one scripted verbalization. At the follow-up session, which took place three weeks after the intervention ended, he did not demonstrate any scripted verbalizations.

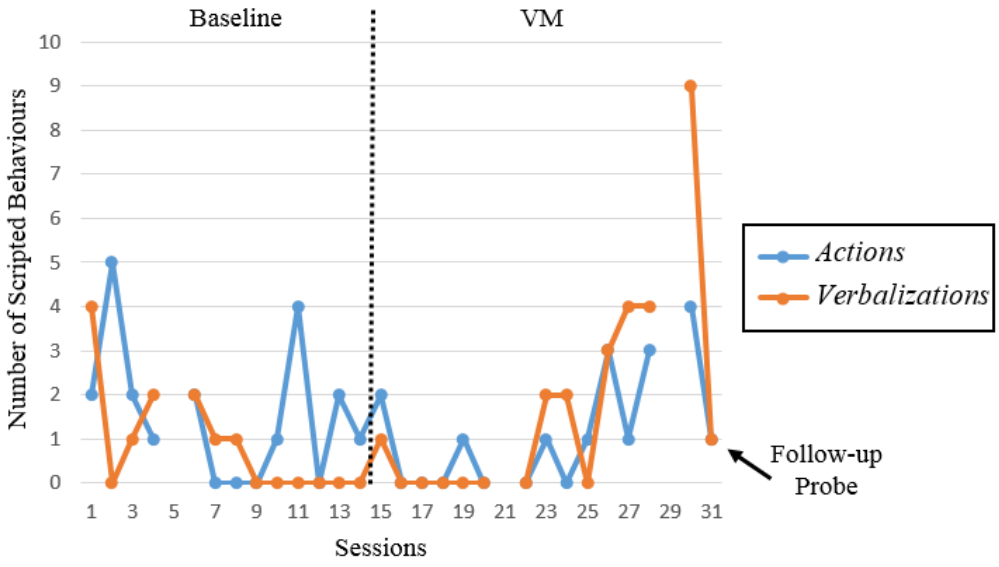
Table 34. Joseph's scripted verbalizations for the town play set

Scripted Verbalizations	***Session(s)***
"Nee naw, nee naw."	20, 24
"Walk, walk, walk, walk, walk, walk."	27
"Post office first."	30

5.3.2.3.2 ***Joseph's unscripted behaviours for the town play set***

The rate of Joseph's unscripted play actions and verbalizations for the town play set are shown in Figure 24.

Figure 24. Joseph's unscripted play actions and verbalizations for the town play set



Following the introduction of the video modelling intervention in session 15, Joseph's *unscripted play actions* decreased from a mean baseline level of 2 (range 0-5) to a mean level of 1 (range 0-3). He demonstrated unscripted play actions in 19 out of the 29 sessions he participated in, which equates to about 66% of sessions. He demonstrated the highest number of unscripted play actions in sessions 10, 25 and 27 (N=5, 4 and 11 respectively). In looking at Figure 24, one can see a decrease in Joseph's unscripted play actions from the beginning to the end of the baseline phase, followed by an increase from sessions 23-31. On the last session that he participated in prior to the follow-up session, Joseph demonstrated four unscripted actions, which was at a higher level than the average mean throughout the intervention. At the follow-up session, which took place three weeks after the intervention ended, he only demonstrated one unscripted play action.

Table 35. Joseph's unscripted play actions for the town play set

Unscripted Play Actions	***Session(s)***
Opened the door to the police station	1, 2, 6, 11, 15
Placed a character inside the police station	1, 6, 10, 11
Rang the welcome mat in the police station with a character there	15
Closed the door to the police station	2
Placed a character in the phone booth and rang the phone	2, 14, 28
Placed a character in the phone booth without ringing the phone	25, 30
Walked a character on the table (not modelled)	4, 28, 30
Opened the door to the post office	19
Rang the welcome mat in the post office with a character there	13, 28
Placed a character in the motorcycle or motorcar	24
Closed door to the toy shop	31

Joseph's *unscripted verbalizations* increased from a mean baseline level of 1 (range 0-4) to a mean level of 2 (range 0-9), following the introduction of the video modelling intervention in session 15. He demonstrated unscripted verbalizations in 9 out of the 29 sessions he participated in, which equates to about 31% of sessions. He demonstrated the highest number of unscripted verbalizations in sessions 4, 15 and 29 (N=3, 3 and 11 respectively). In looking at Figure 24, similar to the findings with the unscripted play actions, one can see a decrease in Joseph's unscripted verbalizations from the beginning to the end of the baseline phase, followed by an increase from sessions 23-31. On the last session that he participated in prior to the follow-up session, Joseph demonstrated nine unscripted verbalizations, which was at a higher level than the average mean throughout

the intervention. At the follow-up session, which took place three weeks after the intervention ended, he only demonstrated one unscripted verbalization.

Table 36. Joseph's unscripted verbalizations for the town play set

Unscripted Verbalizations	***Session(s)***
"Cute telephone."	1
"Bye-bye sound."	1
"Play town."	1
"Bye-bye town."	1
"Telephone."	2
"Eating."	4
"Go home."	4
"Hey!"	6
"Playing telephone."	6
"Phone."	7
"Hey mine!"	8
"Playing town."	15
"Good playing town."	24
"All finished."	24
"Close the door."	27
"Police."	27
"I'm the man."	27
"The postal worker."	27
"I'll get it back."	28
"I got the telephone."	28
"The toy shop."	28
"And Grandpa going in toy shop."	28
"I'm going to the post office."	30
"Liam I want to go in the toy shop."	30
"I want to go in."	30
"Liam help me."	30
"Oh no, broken!"	30
"I'm going to the toy shop."	30
"Uh, not working!"	30
"Oh fall on your head."	31

5.3.2.3.3 ***Joseph's qualitative findings for the town play set***

Joseph demonstrated very minimal increases in targeted scripted actions and scripted verbalizations after the introduction of the video modelling.

Similar to the findings with the farm play set, Joseph imitated some of the verbalizations and actions of his peers. For example in session 6, a peer stated "He's just fixing the toy shop" while sliding a character back and forth across the roof of the toy shop. Joseph imitated the same statement and action. Similar to his social behaviours with the farm

play set, Joseph also gathered several items in a group to hold in his hand or lap (sessions 7, 9 and 10) with the town play set.

He did demonstrate some awareness of character as agent by placing a character in the phone booth and pressing the button to activate the phone at the same time (session 3). He also used a character to ring the welcome mat of the police station (session 15).

5.3.3 ***Group 2 Fairground Play Set Results (Control Group)***

The participants did not watch any video or receive any specific instructions prior to their play with this play set. Following the prompt to play, participants and their mainstream peers played with the play set for four minutes. (See §3.12.1 for a picture of the fairground play set and a listing of the toys available to play with.)

As this play set did not have a video presentation, a script was not developed. However, a list of 13 functional play actions for this play set was created. They can be found in Table 37 below.

Table 37. Functional play actions for the fairground play set

1	Placed character in the rocket ride
2	Took character out of the rocket ride
3	Swung rocket ride with a character in it
4	Walked character on or off the steps from the rocket ride
5	Placed character on a horse in the carousel
6	Took character off a horse in the carousel
7	Spun the carousel ride with a character in it
8	Placed character on the steps of the carousel
9	Placed character on the button for music for the carousel
10	Placed character in the ship ride
11	Took character out of the ship ride
12	Swung ship ride with a character in it
13	Walked character on the table

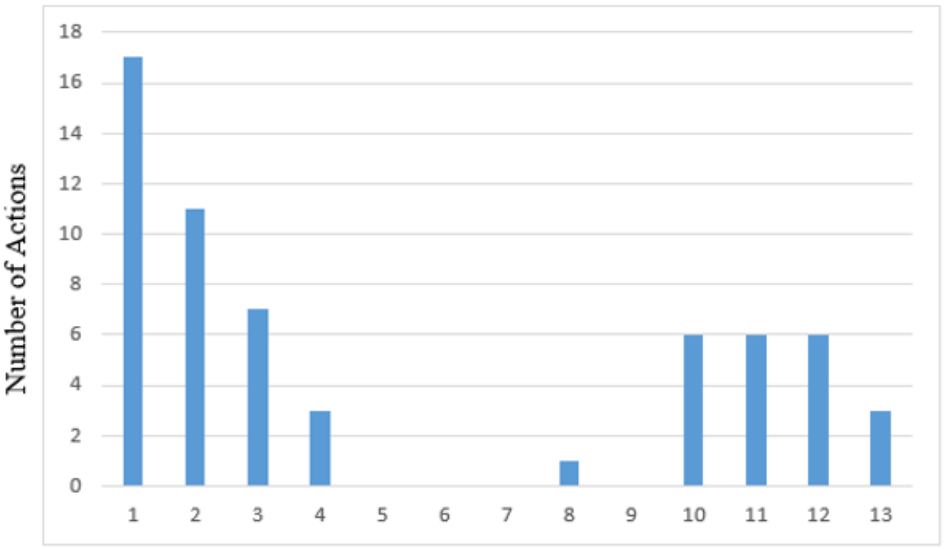
5.3.3.1 **Group 2, Participant 1 – Esther**

5.3.3.1.1 ***Esther's functional play actions for the fairground play set***

The rate of Esther's functional play actions for the fairground play set are shown in Figure 25 below. Over the course of 12 sessions, Esther demonstrated 60 functional play

actions. She demonstrated the highest number of the following actions: placed character in the rocket ride (29%; N=17), took character out of the rocket ride (19%; N=11), swung rocket ride with a character in it (12%; N=7), placed character in the ship ride (10%; N=6), took character out of the ship ride (10%; N=6), and swung ship ride with a character in it (10%; N=6). Other actions were demonstrated with a range from 0-5% (N=0-3).

Figure 25. Esther's functional play actions for the fairground play set



Functional Play Actions from Table 37

5.3.3.1.2 ***Esther's verbalizations for the fairground play set***

While playing with the fairground play set, Esther only made one verbalization in session 8 as reflected in Table 38 below.

Table 38. Esther's verbalizations for the fairground play set

Verbalizations	***Session(s)***
"Eeh!" (verbal protest)	8

5.3.3.1.3 ***Esther's qualitative findings for the fairground play set***

In contrast to Esther's social play behaviours with the other two play sets, with the fairground play set she demonstrated more non-functional play. For example, she would spin the fairground rides without a character inside them (sessions 4, 6, and 9). During session 6 for example, she spun the carousel three times and the rocket ride two times without a character in them. In session 15, she repeatedly spun the empty ship ride on her lap and on the table. The act of repeatedly spinning the empty ride could be seen as either

self-stimulatory or as a repetitive type of behaviour. She was also observed spinning the rocket ride while holding it in the air (session 9). This action was considered non-functional play.

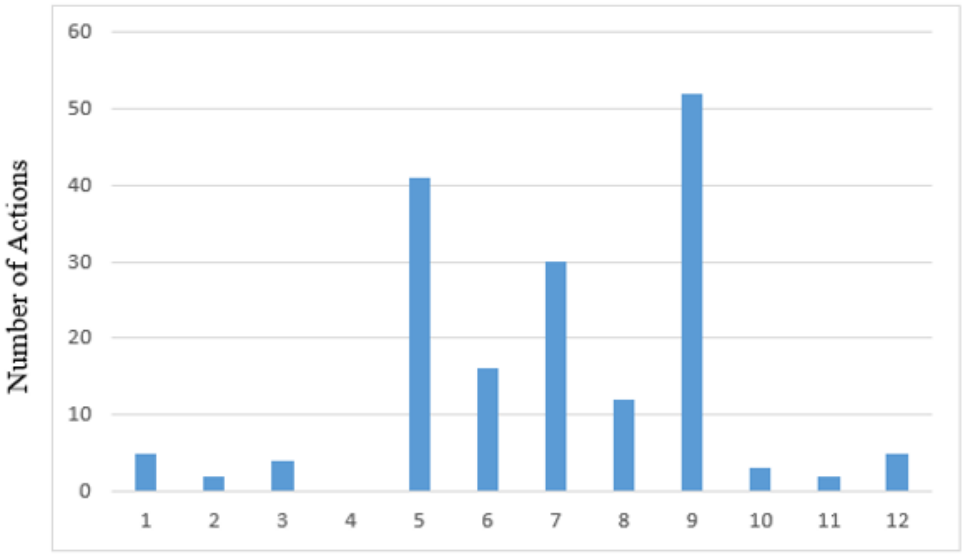
She demonstrated some 'character as agent' actions, such as walking a character on the table and walking a character on and off the steps to the rocket ride. She also spun rides after placing a character in them. Please refer back to Figure 25 for additional functional play actions she demonstrated. Although she demonstrated some 'character as agent' actions, she did so at a much lesser degree than what was observed with the other two play sets.

5.3.3.2 **Group 2, Participant 2 – Liam**

5.3.3.2.1 ***Liam's functional play actions for the fairground play set***

The rate of Liam's functional play actions for the fairground play set are shown in Figure 26 below. Over the course of 12 sessions, Liam demonstrated 173 functional play actions. He demonstrated the highest number of the following actions: placed character on the button for music for the carousel (30%; N=52), placed character on a horse in the carousel (24%; N=41), spun the carousel ride with a character in it (17%; N=30), took character off a horse in the carousel (9%; N=16), placed character on the steps of the carousel (7%; N=12). Other actions were demonstrated with a range from 0-4% (N=0-6).

Figure 26. Liam's functional play actions for the fairground play set



Functional Play Actions from Table 37

5.3.3.2.2 ***Liam's verbalizations for the fairground play set***

Liam demonstrated verbalizations in four sessions out of the 13 sessions involving the fairground play set. All of his verbalizations were verbal protests with the exception of one. In session 2, he said "aah" as he was trying to place a character on a horse in the carousel. See Table 39 below for a listing of his verbalizations for the fairground play set.

Table 39. Liam's verbalizations for the fairground play set

Verbalizations	***Session(s)***
"Ooh…aah!" (verbal protest)	2
"Aah."	2
"Aah…uheeh!" (verbal protest)	2
"Aah-uh!" (verbal protest)	4
"Aah!" (verbal protest)	4, 6, 9
"Aah…uh…aah!" (verbal protest)	6

5.3.3.2.3 ***Liam's qualitative findings for the fairground play set***

Similar to Liam's social behaviours with the other play sets, he was active in his play. He would lean across the table to reach an object. He would pull a toy from a peer and utter a verbal protest (session 2). He would also push a peer's hand away when a peer tried to obtain a toy that he was playing with (session 2). However, he did demonstrate a high level of non-functional play actions. For example, he would spin the fairground rides when they were empty (sessions 3, 4, 6, 7, 8, 10 and 11). He would not just spin them once, but several times. For example in session 3, he spun the empty carousel five times; in session 6 four times; and in session 8 he spun the empty ship ride four times. The act of repeatedly spinning the empty ride could either be seen as self-stimulatory or as a repetitive type of behaviour. He also was observed stacking characters on top of each other in a sort of tower, which was considered non-functional play (session 6).

When referring back to Figure 26 for his functional play actions, Liam did demonstrate 'character as agent' actions by placing characters on the button for music for the carousel. He also placed characters on a horse in the carousel and on the steps of the carousel.

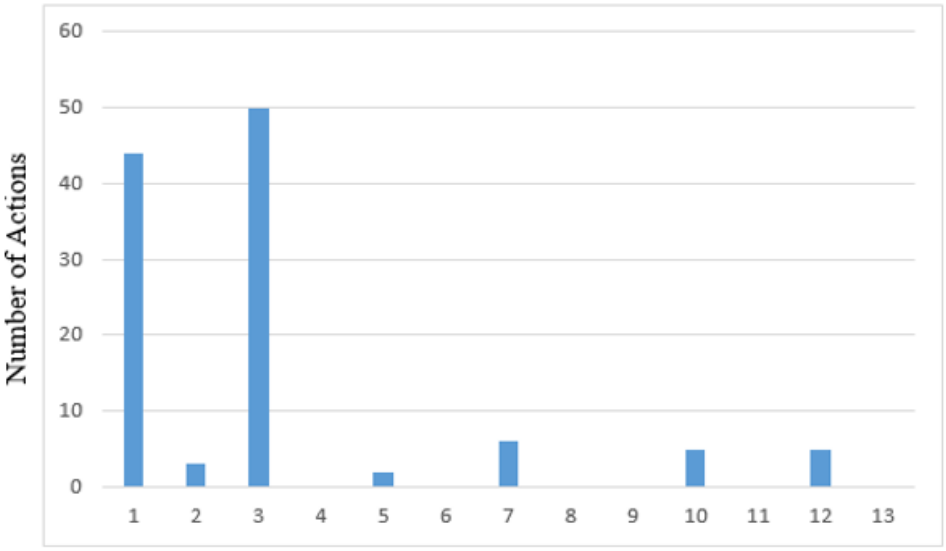
5.3.3.3 **Group 2, Participant 3 – Joseph**

5.3.3.3.1 ***Joseph's functional play actions for the fairground play set***

The rate of Joseph's functional play actions for the fairground play set are shown in Figure 27 below. Over the course of 12 sessions, Joseph demonstrated 115 functional

play actions. He demonstrated the highest number of the following actions: swung rocket ride with a character in it (43%; N=50), placed character in the rocket ride (38%; N=44), spun the carousel ride with a character in it (5%; N=6), placed character in the ship ride (4%; N=5), and swung ship ride with a character in it (4%; N=5). Other actions were demonstrated with a range from 0-3% (N=0-3).

Figure 27. Joseph's functional play actions for the fairground play set



Functional Play Actions from Table 37

5.3.3.3.2 ***Joseph's verbalizations for the fairground play set***

While playing with the fairground play set, Joseph demonstrated verbalizations in 5 out of the 13 sessions. In looking at Table 40 below, one can see that the majority of his verbalizations were comments to himself rather than initiations to play or interactions or responses to peers.

Table 40. Joseph's verbalizations for the fairground play set

Verbalizations	***Session(s)***
"Fairground."	1
"Time to finish."	2
"Play."	2
"Ooh, wee."	2
"Come on play."	3
"Mine."	7
"Oh."	11
"Try it again."	11
"Ooh…away."	11
"Ooh."	11

"Ooh under man."	11
"Ooh…table."	11
"Ooh fall again."	11
"Oh no."	11
"Girl."	11

5.3.3.3.3 ***Joseph's qualitative findings for the fairground play set***

Joseph's social behaviours with the fairground play set could be characterized as quite repetitive and stereotypical in nature. He demonstrated a high level of perseverative actions such as spinning the carousel ride, spinning the rocket ride and swinging the ship ride repeatedly. For example in session 3, he repeatedly spun the empty rocket ride 18 times. This could also be seen in sessions 2, 4, 5 and 9 where he spun an empty ride 6, 4, 5, and 5 times respectively. Joseph also demonstrated some self-stimulatory behaviours such flapping his hands (sessions 1, 3 and 5).

Similar to his social behaviours with the other play sets, Joseph would gather a group of characters and hold them in his lap without interacting with them or animating them (sessions 7-10). However with this play set, Joseph did demonstrated some 'character as agent' actions such as placing a character in a fairground ride and spinning the ride with the character in it.

5.4 Interobserver Agreement

All videotapes (baseline, intervention and probes) were transcribed and scored by this researcher based on the operational definitions of the dependent measures (see §3.14.1.1) and functional play skills for the control group (see §5.2.3). In addition, the research assistant (RA) independently scored the transcripts for 30% of all sessions across phases. The RA was blind to the experimental conditions. The RA was trained by the researcher (for 5 hours) to use the operational definitions to score the dependent measures. For training purposes, the researcher and the RA both scored two randomly selected transcripts from each play set.

The interobserver agreement achieved during training was as follows: scripted actions 94%; scripted verbalizations 85%, unscripted actions 99%; unscripted verbalizations 93%; and control group 91%. The interobserver agreement achieved for the farm play set was as follows: scripted actions 88%; scripted verbalizations 72%; unscripted actions 90%; and unscripted verbalizations 77%. For the town set, interobserver agreement was

87% scripted actions; 64% scripted verbalizations; 96% unscripted actions; and 81% unscripted verbalizations. The interobserver agreement for the control group was 82%.

5.5 Visual inspection of the data

In single-subject designs, visual inspection is the most common method of evaluating the data (Engel and Schutt, 2014). Through visual inspection any levels, patterns, trends and variability within the data can be identified. This can be for a given participant, within participants, or within groups of participants. In what follows, I will explain each of these components. Identifying levels involves looking to see if the target variable has changed from the baseline to the intervention phase (Engel and Schutt, 2014). Trends refers to the direction the data points are taking. The trend may be increasing, decreasing, cyclical, or curvilinear (Engel and Schutt, 2014). If a trend is identified in the baseline phase, it is important to look at whether the direction of the trend changes when the intervention is introduced. Variability can also be identified through visual inspection. Variability refers to how different or divergent the data points are within a phase (Engel and Schutt, 2014). Engel and Schutt (2014) point out that the assessment of the intervention is more difficult when the data points are widely divergent in any given phase, whether the baseline phase or the intervention phase.

In this section, I will present the results in a multiple-baseline fashion for both scripted play behaviours and unscripted play behaviours. By doing so, the same figures that have been analysed in isolation within subjects and play sets (in §5.2 and §5.3 above) can now be visually analysed to compare the effects of the video modelling versus point-of-view video modelling interventions. The graphs will be presented by participant within each group. First, graphs for Group 1 will be presented and discussed. Second, graphs for Group 2 will be presented and discussed. Finally, a short summary will be provided in which any trends or patterns identified within participants or groups will be identified.

5.5.1 Group 1, Participant 1 – John

5.5.1.1 John's Scripted Play Behaviours

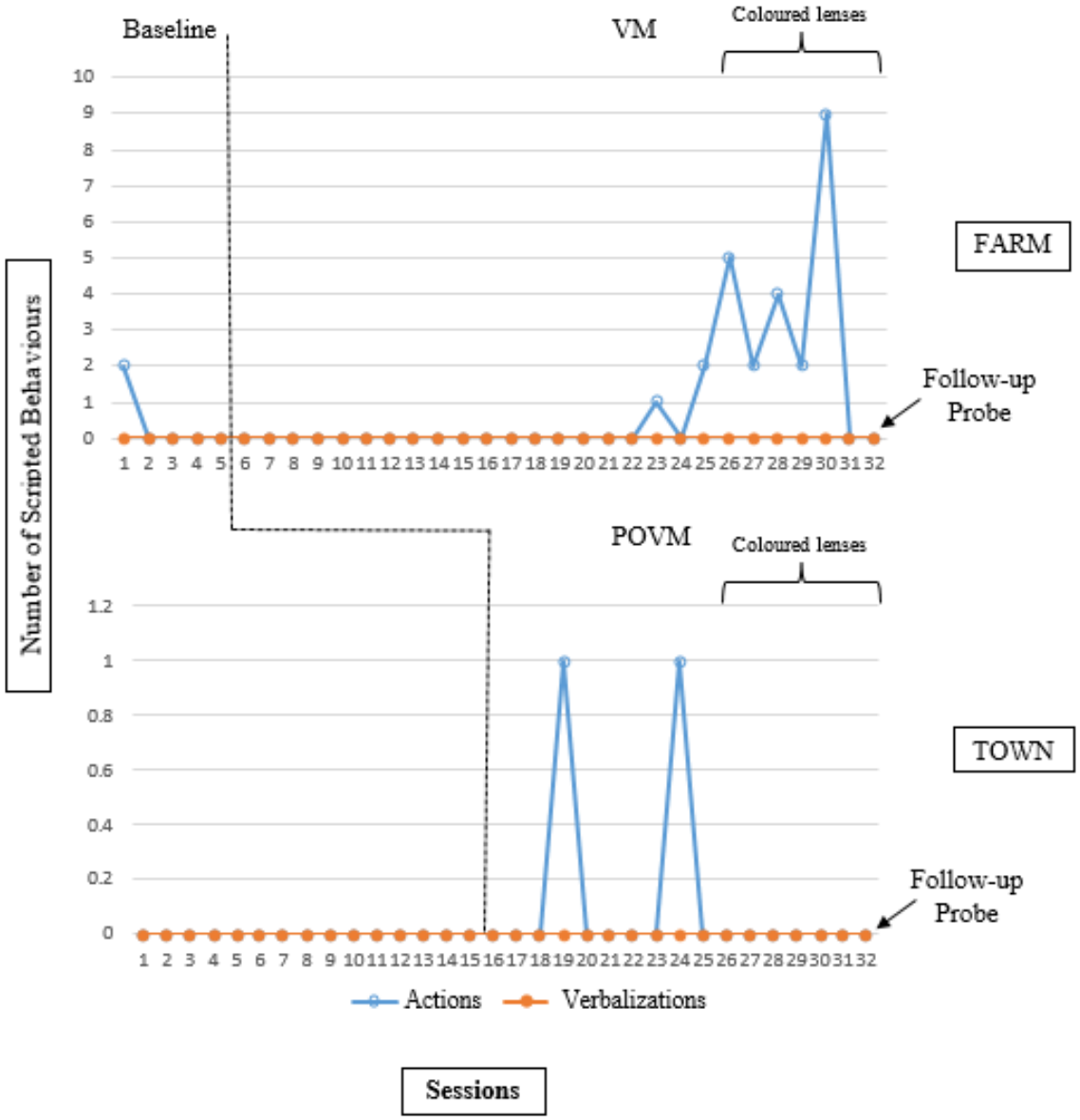


Figure 28. John's Scripted Play Behaviours

In visually analysing John's scripted play behaviours one cannot identify any consistent trend or pattern. However, during sessions 26 to 32 when John wore special coloured lenses, there is an upward trend, although variable, following video modelling with the farm play set. As mentioned before, however, the outside variable of John wearing special coloured lenses may have impacted the results obtained during these sessions. This was discussed further in §5.2.1.1.3.

5.5.1.2 John's Unscripted Play Behaviours

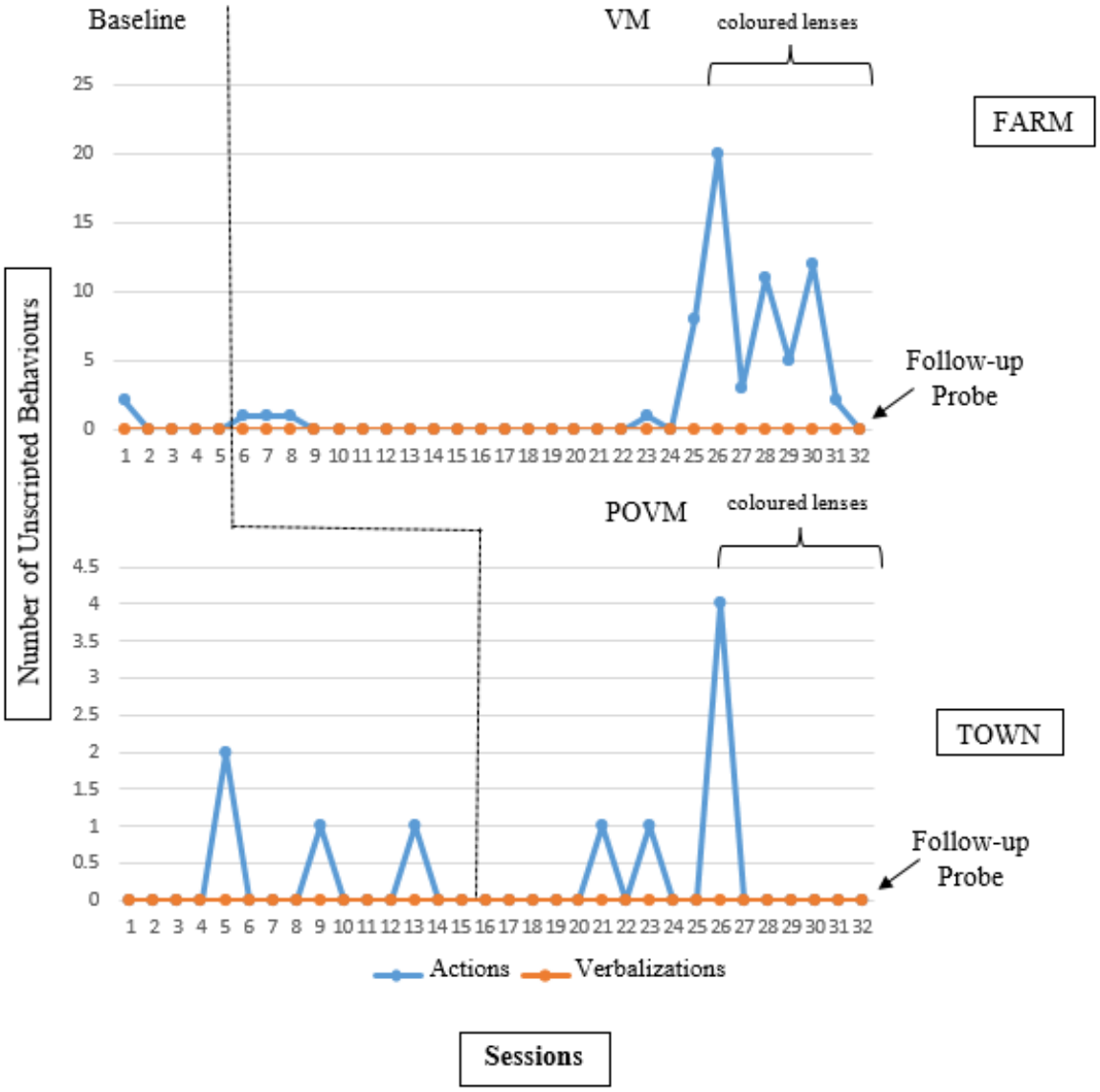


Figure 29. John's Unscripted Play Behaviours

Similar to the findings with John's scripted play behaviours, when visually analysing Figure 29 for his unscripted play behaviours, John demonstrates more unscripted play behaviours following the video modelling intervention model than the point-of-view video modelling model. However, his behaviours are variable, while keeping in mind that the majority of these behaviours occurred between sessions 26-32 when John wore his special coloured lenses.

5.5.2 Group 1, Participant 2 – David

5.5.2.1 David's Scripted Play Behaviours

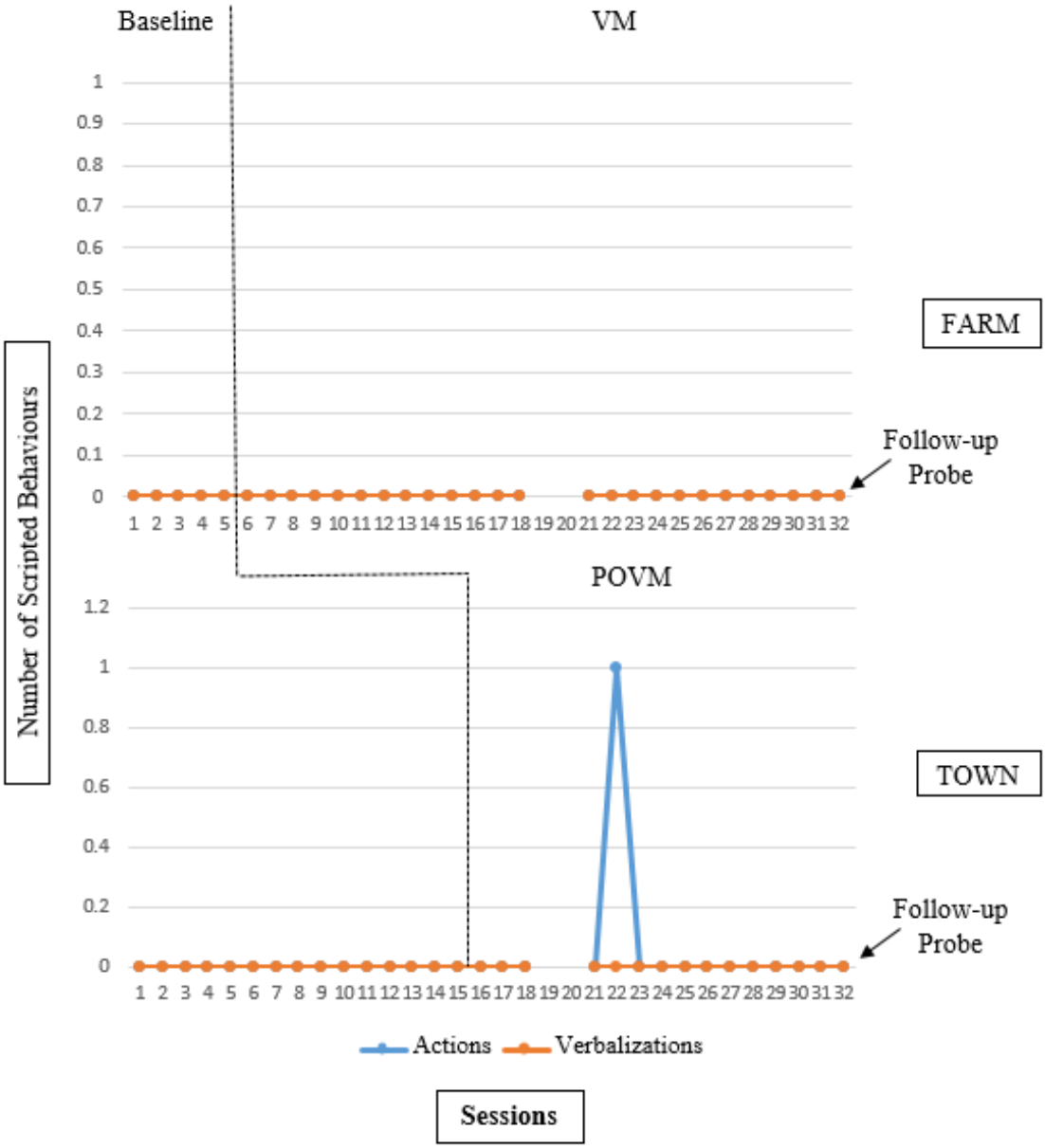


Figure 30. David's Scripted Play Behaviours

As can be seen in Figure 30, David only exhibited one scripted play behaviour following the point-of-view video modelling intervention. Information regarding levels, trends or variability cannot be obtained from the data obtained on this participant.

5.5.2.2 David's Unscripted Play Behaviours

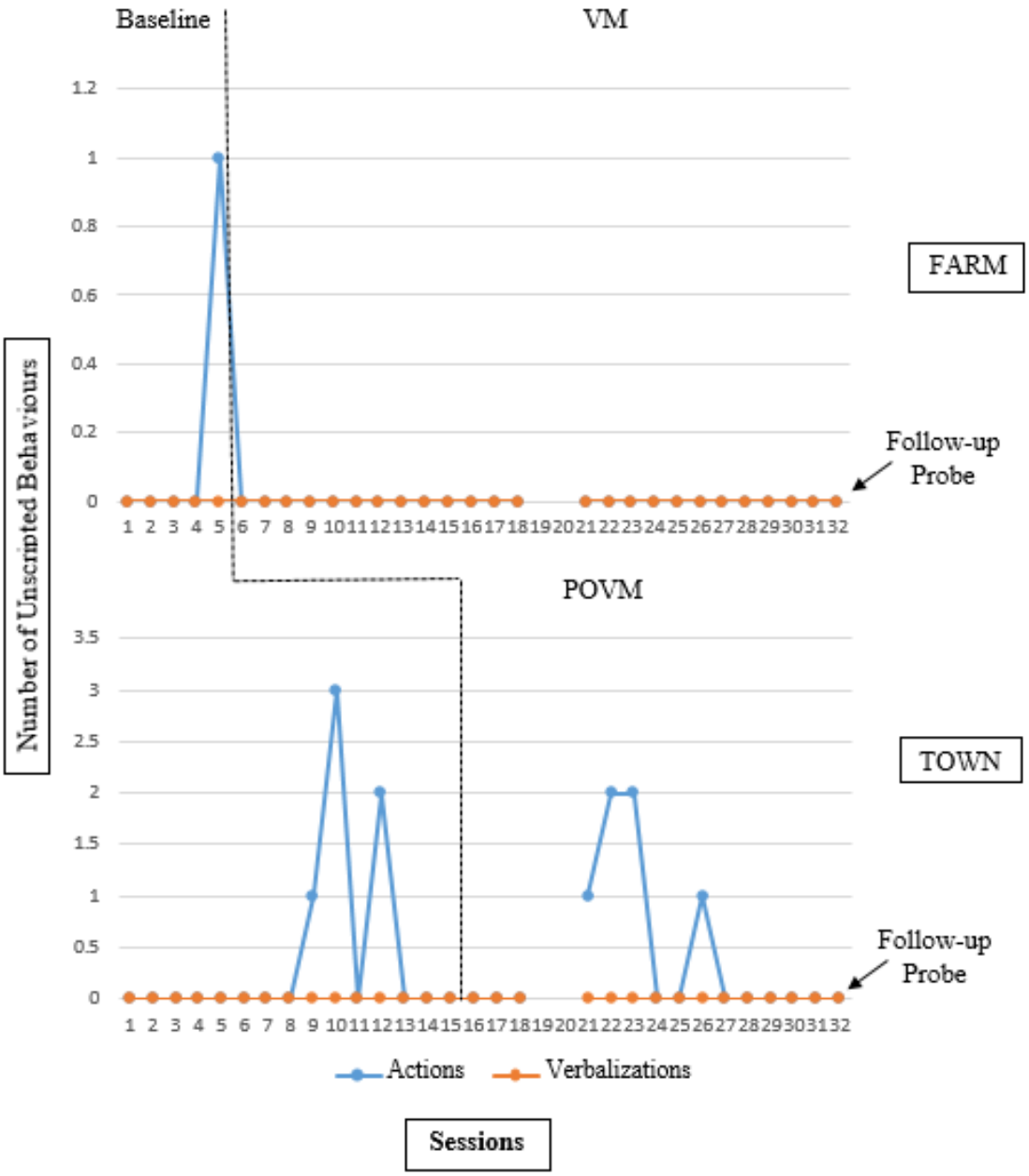


Figure 31. David's Unscripted Play Behaviours

In looking at the comparison of intervention models in regards to David's unscripted play behaviours, his behaviours were non-existent following the video modelling intervention. He did exhibit unscripted play behaviours following the point-of-view video modelling intervention. However, at a declining level.

5.5.3 Group 2, Participant 1 – Esther

5.5.3.1 Esther's Scripted Play Behaviours

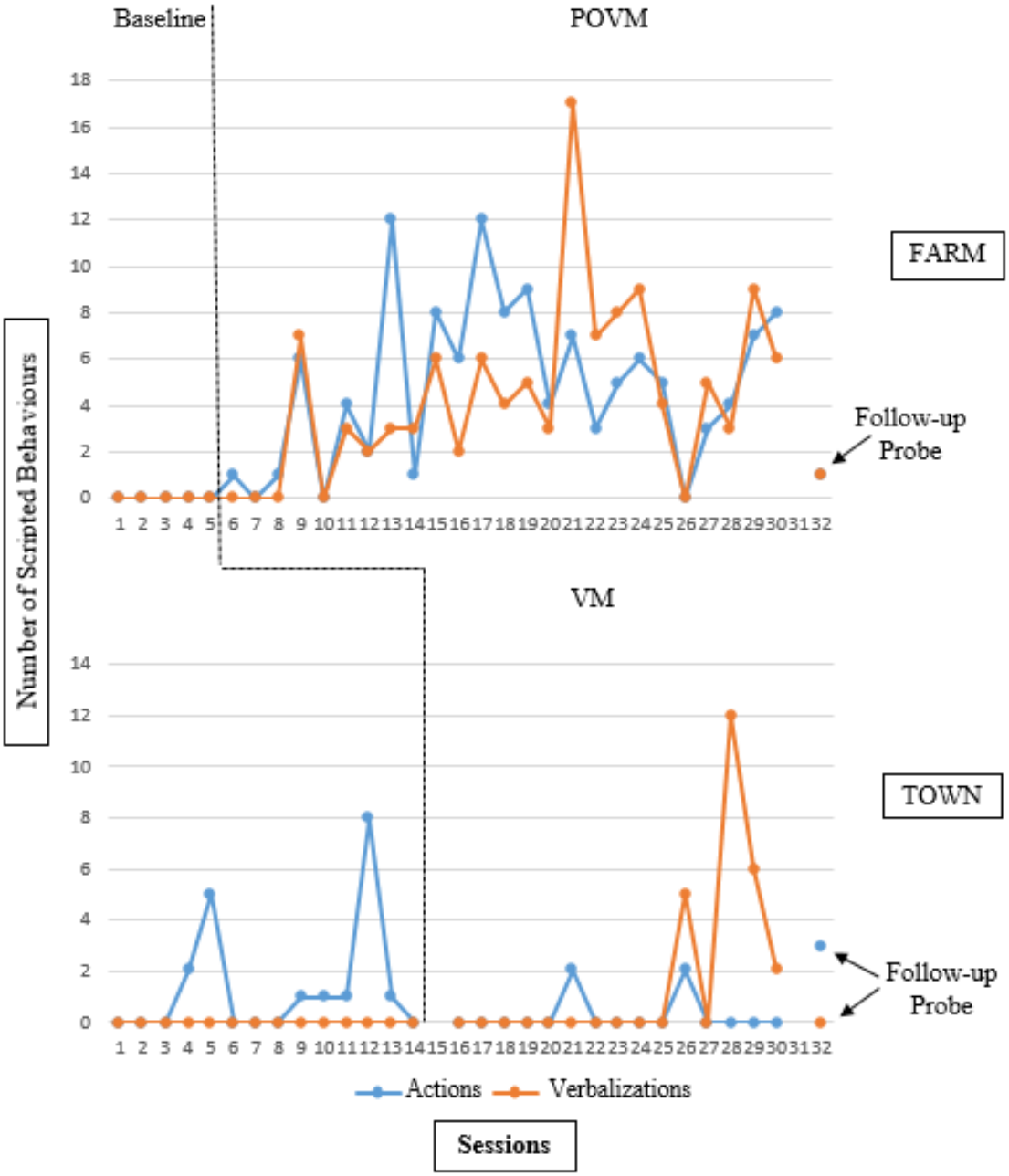


Figure 32. Esther's Scripted Play Behaviours

Using the method suggested by Nugent (2001), if a line were drawn from the first lowest data point in the intervention phase to the last data point in the farm play set, one can see an upward trend in Esther's scripted play behaviours following the point-of-view video modelling intervention. This is evident with both her scripted actions (from 1 to 8) as well as her scripted verbalizations (from 0 to 6). This is in comparison to a flat line trend during the baseline phase with the farm play set.

With the town play set, Esther did demonstrate some scripted play behaviours following the video modelling intervention, however at a minimal level (0-2).

5.5.3.2 Esther's Unscripted Play Behaviours

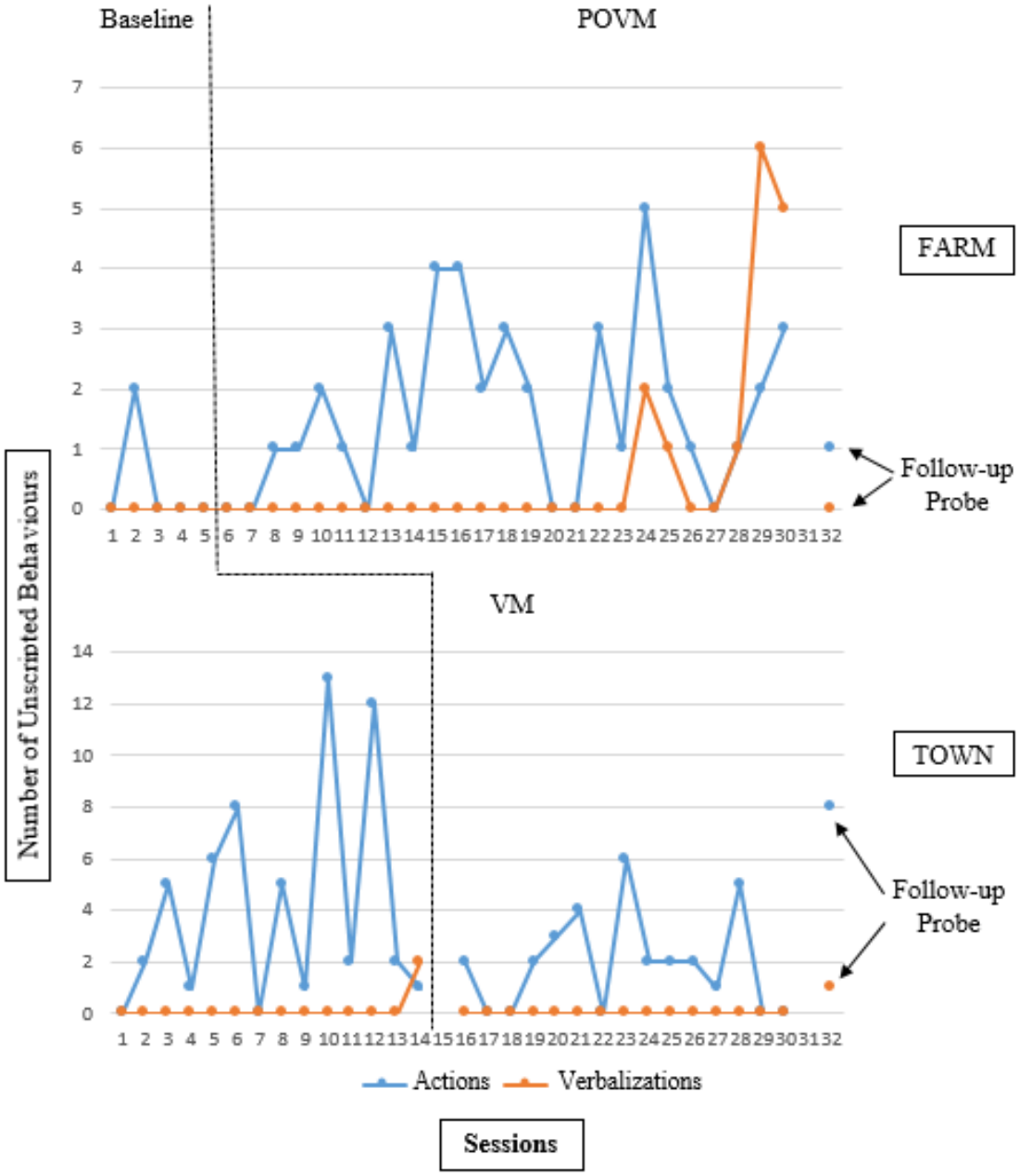


Figure 33. Esther's Unscripted Play Behaviours

In looking at Figure 33, while using the same method (Nugent, 2000), an upward trend of unscripted play actions with the farm play set can be seen, following the point-of-view video modelling intervention. This trend spread out over the length of the intervention phase. However, the amount of increase in the trend was at a lower level than her scripted play behaviours with the farm play set (an increase from 0 to 3 in actions and from 0 to 5

in verbalizations). In contrast, her unscripted behaviours during the baseline phase of the town set were much more variable.

5.5.4 Group 2, Participant 2 – Liam

5.5.4.1 Liam's Scripted Play Behaviours

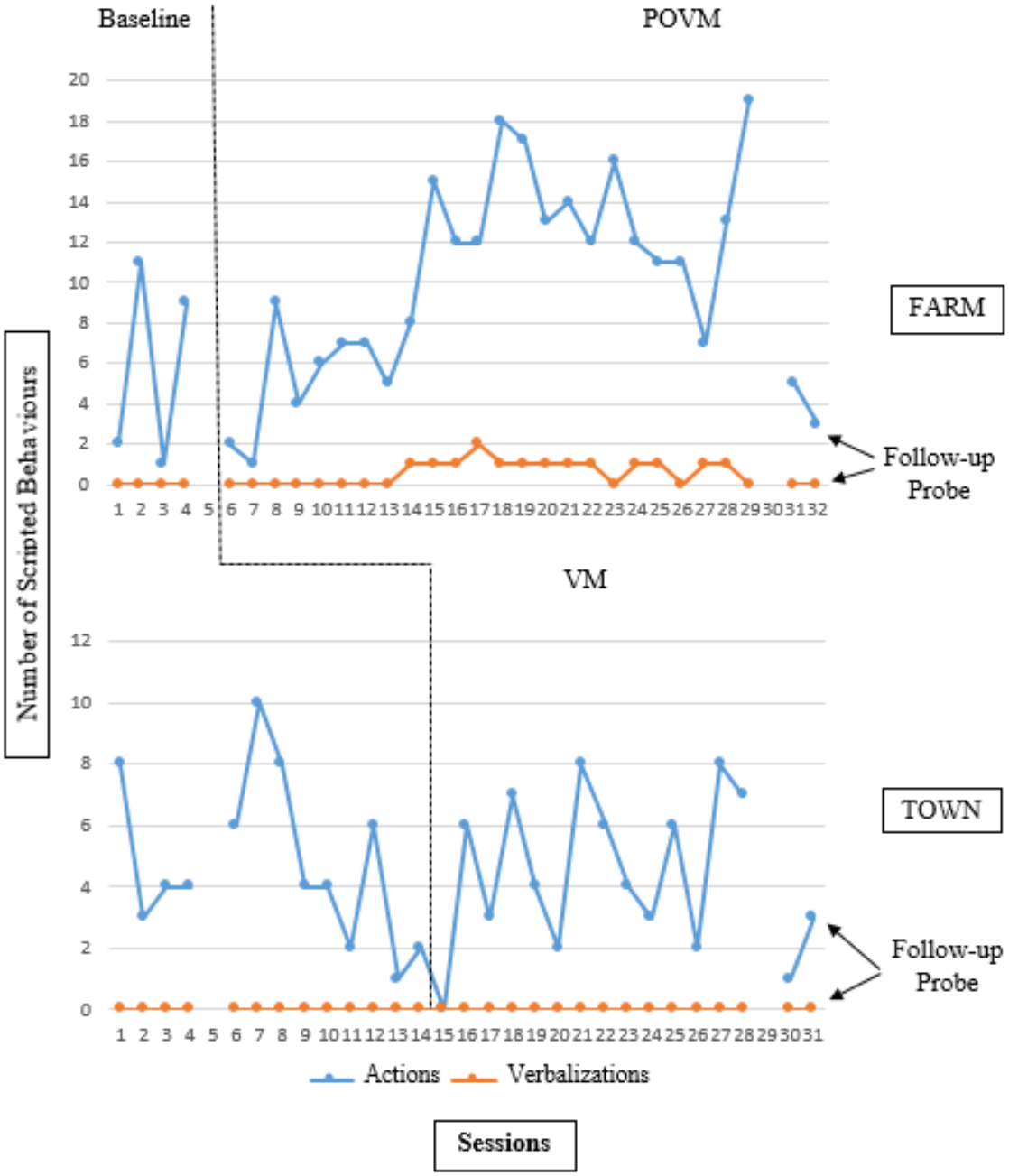


Figure 34. Liam's Scripted Play Behaviours

In comparing the two intervention models, Liam demonstrated an upward trend of scripted actions with both. However, his upward trend following the point-of-view video

modelling intervention was at a greater level (range 2-19). Whereas following the video modelling intervention, his upward trend ranged from 0-7. Some variability can be noted following both models, however there appears to be less variability and more of a steady upward trend following the point-of-view video modelling intervention. His scripted verbalizations were minimal to none as noted in the previous findings section (§5.3.1.2). Liam demonstrated a slight increase of actions during the baseline phase with the farm set (range 2 to 10). However, the data points in the intervention phase increased to a higher level observed in the baseline phase. In comparison, with the town play set, his data points in the baseline phase decreased (range of 8 to 2), with a variable, yet steady increase during the intervention phase (range 0 to 7).

5.5.4.2 Liam's Unscripted Play Behaviours

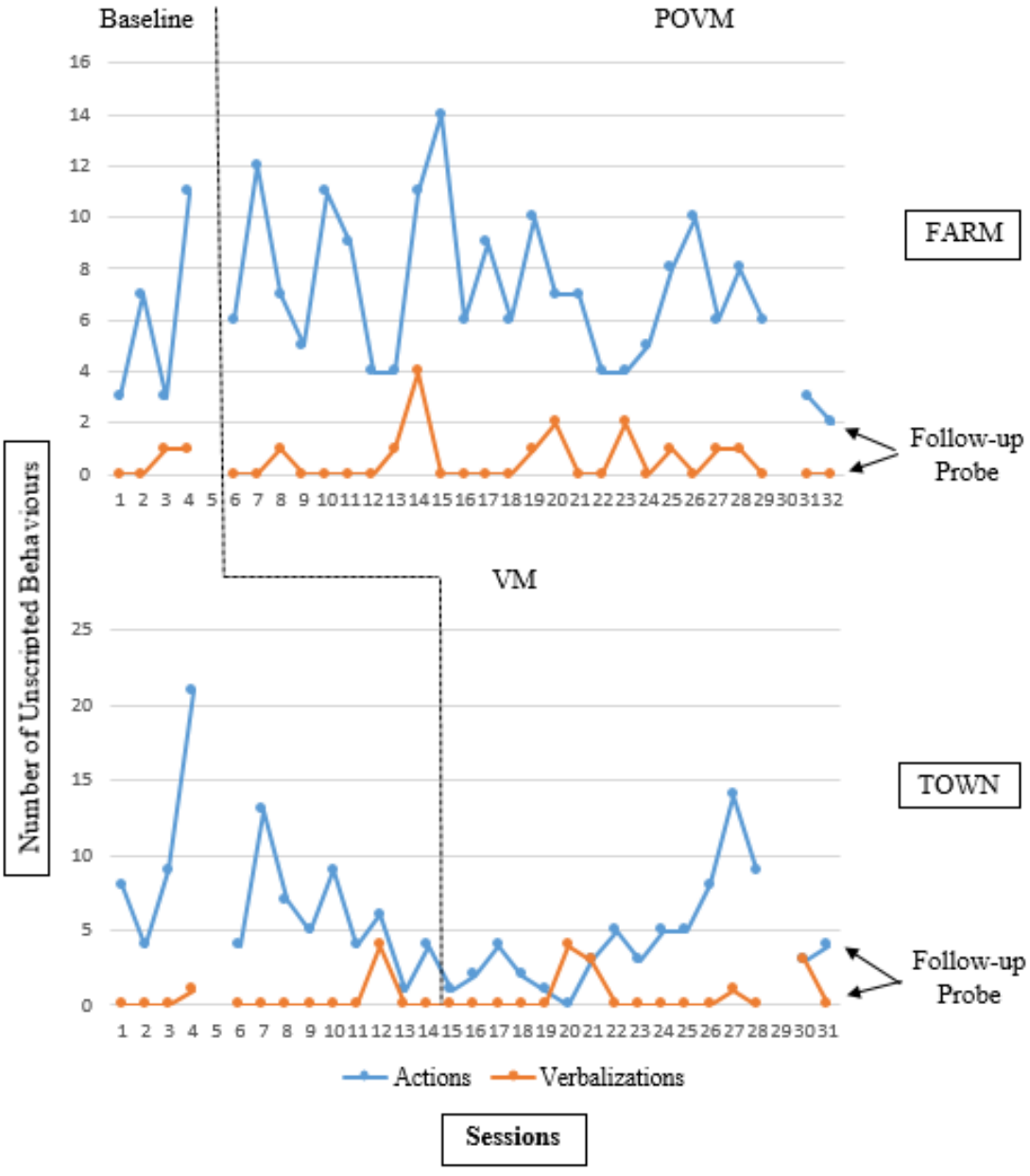


Figure 35. Liam's Unscripted Play Behaviours

In looking at Liam's unscripted play actions in the farm play set, the trend is flat, or can be seen as remaining the same. This can be seen if a line were to be drawn from the first lowest data point in the intervention phase to the final data point. They are at the same level. Using the same method with the town play set, the trend of actions show a slight increase from a level of 1 to 9. The findings for his unscripted verbalizations are commensurate with that of his scripted verbalizations. These have been discussed further in the previous findings section (§5.3.1.2).

5.5.5 Group 2, Participant 3 – Joseph

5.5.5.1 Joseph's Scripted Play Behaviours

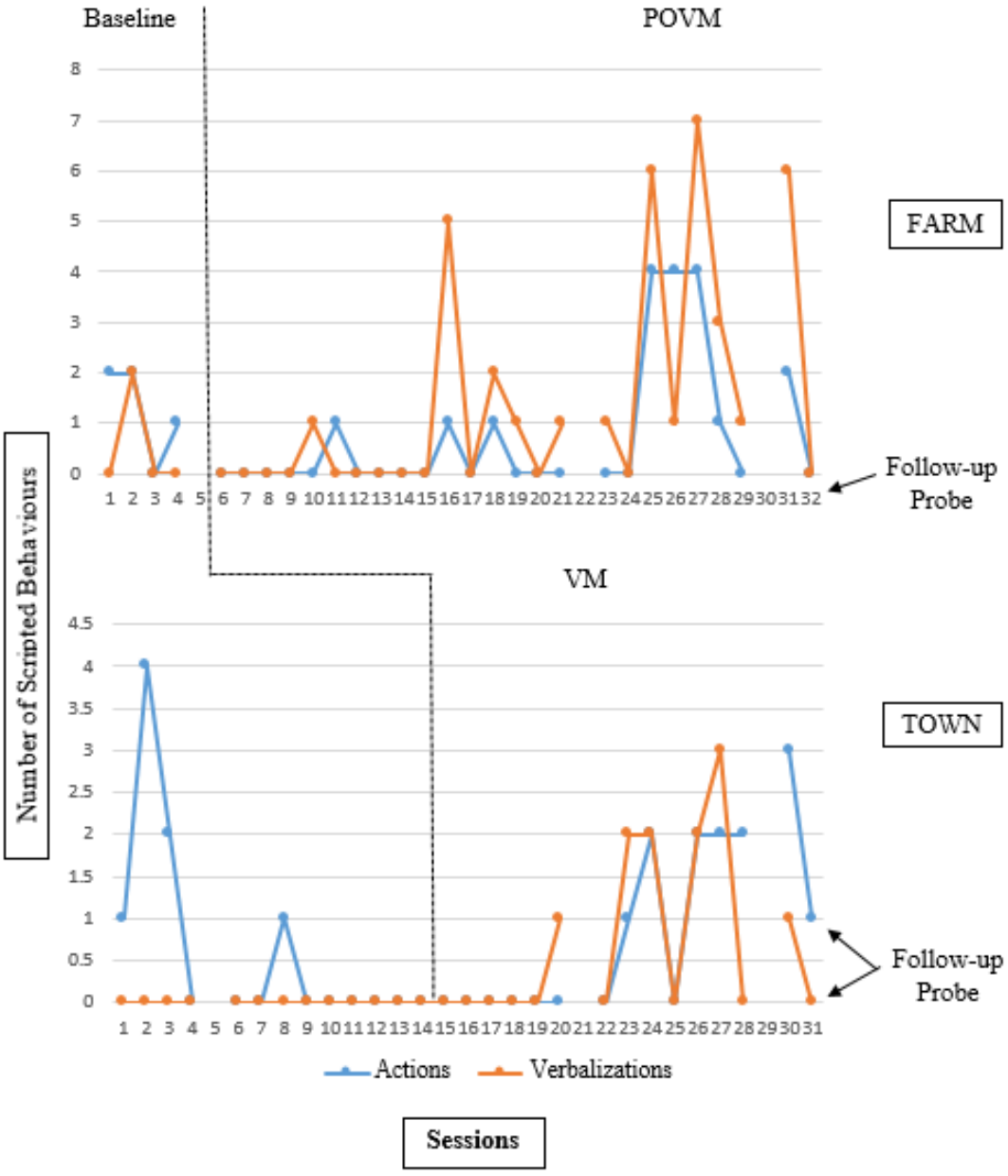


Figure 36. Joseph's Scripted Play Behaviours

Using the same method, Joseph's scripted play behaviours could be considered a flat trend. He did demonstrate scripted actions following both intervention models, however they both returned to zero. In looking at the range of scripted actions, he demonstrated the same level for both intervention models (range 0-4), mean level of 1. His scripted verbalizations following the point-of-view video modelling intervention was flat as well. Following the video modelling intervention, one could say there was a slight increase from 0 to 1, however this is minimal to non-existent.

5.5.5.2 Joseph's Unscripted Play Behaviours

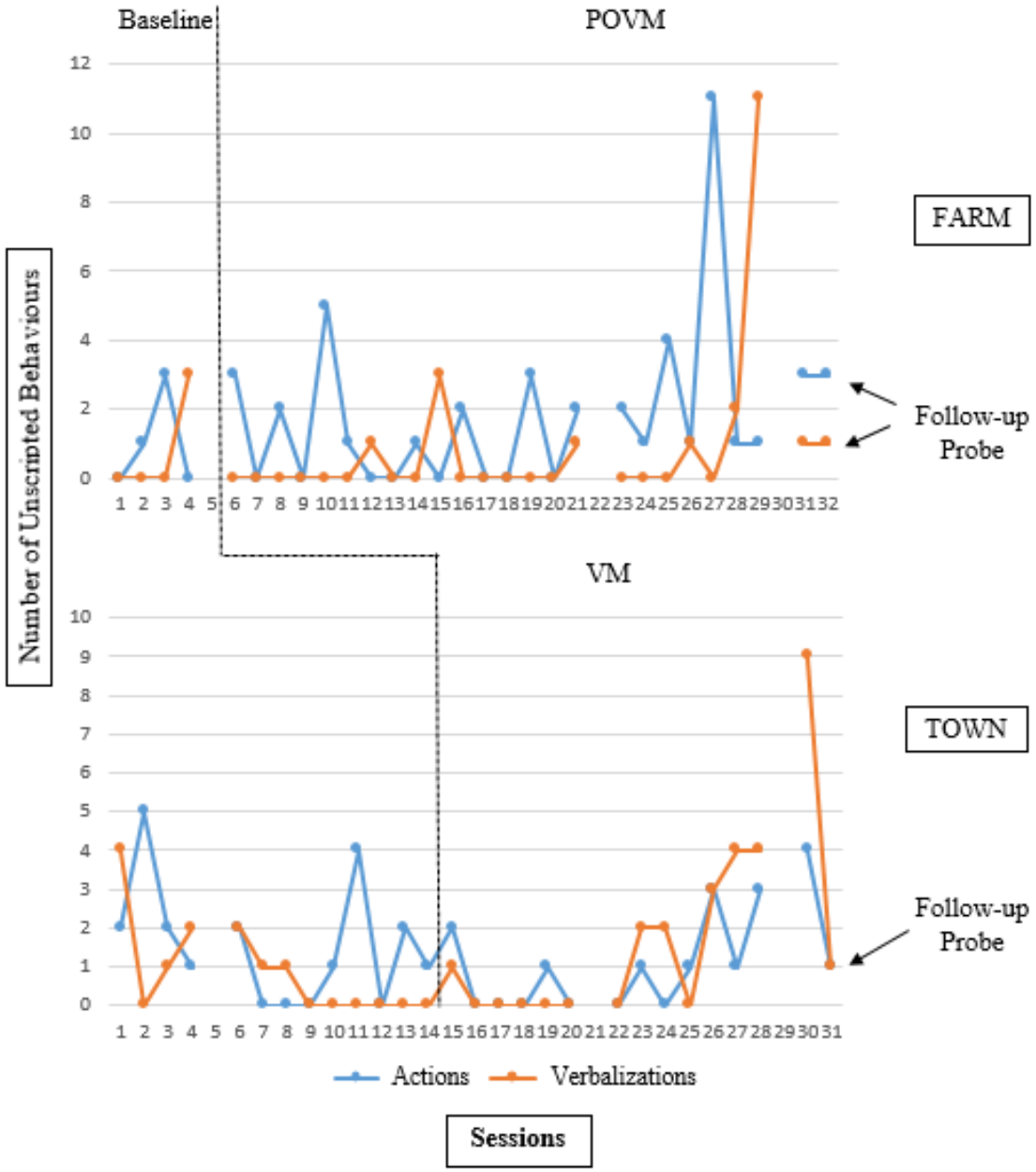


Figure 37. Joseph's Unscripted Play Behaviours

Joseph's unscripted actions following both interventions remained the same. This can be seen by drawing a line from the first data point in the intervention phase to the final data point in the intervention phase. His unscripted verbalizations moved from a 0 to a 1 following the point-of-view video modelling intervention. However, this is minimal to non-existent. His verbalizations following the video modelling intervention remained the same (range of 1) from the beginning data point to the final data point in the intervention phase.

In summary, through visual analysis of the results from school 1, no substantial information on trends and patterns could be identified with the first group in this school (Group 1). However, in the second group (Group 2), two of the three participants, Esther and Liam, showed a higher level of increased responses with their scripted actions and verbalizations following the point-of-view video modelling intervention compared to that of the video modelling intervention. Despite some variability in the trajectory of the data points, there is a noticeable increase within this group following the point-of-view video modelling intervention as compared to the video modelling intervention.

5.6 Results from the Social Skills Checklist

As discussed in chapters 3 and 4 (§3.6.1.1 and §4.3.1.1), a *Social Skills Checklis*t was completed by the parents and teachers of the participants with autism at the beginning and at the end of the study for three reasons. First, it addressed one of the gaps identified in the systematic literature review for this study. Second, it provided this researcher with a better understanding of the participants' broad range of social skills. Third, it was thought that the social skills checklist might provide some information about changes in the participants' social skills over the course of the study which may or may not be directly linked to this study.

After analysing the results of the checklists pre- and post-intervention a few points need to be discussed. First, the results are extremely variable. For example, one responder indicated which level the child was performing a task pre-intervention, yet stated 'not applicable' for the post-intervention. Further, some responders left items blank, whether by choice or as an oversight. This posed the difficulty of not having a true one-to-one comparison. Some examples of responder variability might help. For one participant his teacher commented that he *often* imitates a peer at the beginning of the study, yet indicated that he *sometimes* did at the end of the study. For another participant, his mother

indicated that the child almost *always* maintained proximity to peers with 1 and 3 feet and played parallel at the beginning of the study. Whereas at the end of the study, his mother indicated that he *often* demonstrates these skills. In other situations, something that was marked as *sometimes* being able to do, was marked as *almost never* at the end of the intervention. Second, due to the extreme variability of the responses, a direct correlation in changes to participants' social skills over the course of the intervention could not be made, whether positive or negative. A table providing a comparison of the responses to the *Social Skills Checklist* pre- and post-intervention are provided in the appendix (See Appendix Z).

5.7 Results from the Feedback Received

5.7.1 Participants' Feedback

The participants involved in this study (N=5) completed a questionnaire at the conclusion of the study. They were provided with three questions in which they responded with a *'like'* or *'dislike'* response. The participants in school #1 were asked each question while presented visual cards representing a happy or a sad face to help them answer each question. The presentation of the cards were alternated for each question to reduce factors involved in over selecting a response on either the left or the right. Following each question, the participants either pointed to the happy or sad face or verbally stated their answer (i.e. happy). Their responses were then recorded by the researcher and later transferred onto the questionnaire on their behalf. Table 41 lists their responses.

Table 41. Participant Questionnaire Responses

Question	like	dislike
1. What do you think about the video?	√ √ √ √	√
2. What do you think about playing with friends?	√ √ √ √ √	
3. What do you think about playing with the toys?	√ √ √ √ √	

5.7.2 Parents' Feedback

The parents of the participants involved in this study (N=5) completed a questionnaire at the conclusion of the study. They were provided with five statements in which they

responded with the following response*: strongly agree, agree, neutral, disagree,* and *strongly disagree.* Table 42 lists their responses.

Table 42. Parent Questionnaire Responses

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. My child's imitation skills have improved over the course of this research study.		√ √ √	√ √		
2. My child's turn taking skills have improved over the course of this research project.		√ √	√ √ √		
3. My child's imaginative skills have improved over the course of this research project.		√	√ √ √ √		
4. I would be interested in learning how to use video modelling at home.	√ √	√ √ √			
5. I would be interested in learning how to use video modelling in the community.	√ √	√ √ √			

*5.7.3 **Teachers' Feedback***

Each teacher of the participants involved in this study (N=2) completed a teacher questionnaire at the conclusion of the study. They were provided with five statements in which they responded with the following response: *strongly agree, agree, neutral, disagree,* and *strongly disagree.* Table 43 lists their responses.

Table 43. Teacher Questionnaire Responses

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. My students have improved their imitation skills over the course of this research study.		√ √			
2. My students have improved their turn taking skills over the course of this research project.		√		√	
3. My students have improved their imaginative skills over the course of this research project.			√	√	
4. I would be interested in learning					

how to use video modelling in my lessons.			√	√	
5. I would be interested in learning how to use video modelling to support my students while they are out in the community.			√	√	

5.8 Summary

In this chapter, the descriptive findings of the quantitative and qualitative data from the first school experiment were presented. First, the data was presented for each participant, within groups, specific to each play set. When looking at the data for each participant, within groups, participants in both groups imitated behaviours from the video modelling and the point-of-view video modelling interventions. Specifically, two out of five participants increased the range of their scripted actions and verbalizations following the video modelling intervention (third-person perspective). In contrast five out of five participants increased the range of their scripted actions following the point-of-view video modelling intervention (first-person perspective), while three out of five participants increased the range of their scripted verbalizations following the point-of-view video modelling intervention. Second, the data was presented in a multiple-baseline format to allow comparison of the video modelling intervention to the point-of-view video modelling intervention. Specifically, by presenting the figures in this manner, any levels, patterns, trends or variability could be identified. Using the method suggested by Nugent (2001) by drawing a line from the lowest data point in the intervention to the last data point, an upward trend of scripted behaviours, following the point-of-view video modelling intervention was identified for two participants in group two. This upward trend was to a higher degree than the trend identified following the video modelling intervention for these same participants. The variability identified within the results will be discussed further in chapter seven in §7.4. Third, the results of the feedback received from the stakeholders in this study— the participants, their parents and their teachers were presented. The next chapter will look at the descriptive findings of the quantitative and qualitative data from the second school experiment, followed by the results of the feedback received from the stakeholders in the study.

Chapter 6. School #2 Results

6.1 ***Introduction***

In this chapter, the descriptive findings of the data obtained in the second school experiment will be presented and will be discussed in the discussion chapter to follow. The first section of this chapter will present quantitative and qualitative results across participants and the frequency of the social behaviours that the participants' demonstrated. In second section, information gathered from a visual inspection of the data will be presented. The third section will introduce the results from the feedback received from the participants, their parents and their teachers.

6.2 ***Quantitative and Qualitative Results across Participants for Experiment #2, School #2***

Two participants were involved at this school, Zac and Eli. For each participant, a summary of their scripted behaviours, unscripted behaviours and qualitative findings of their play behaviours is provided in the following subsections. First the findings of their social behaviours with the pirates play set will be presented (see §6.2.1), followed by the findings of their behaviours with the knights and castle play set (see §6.2.2), and finally the findings of their behaviours with the space play set (see §6.2.3).

6.2.1 ***Pirates Play Set Results***

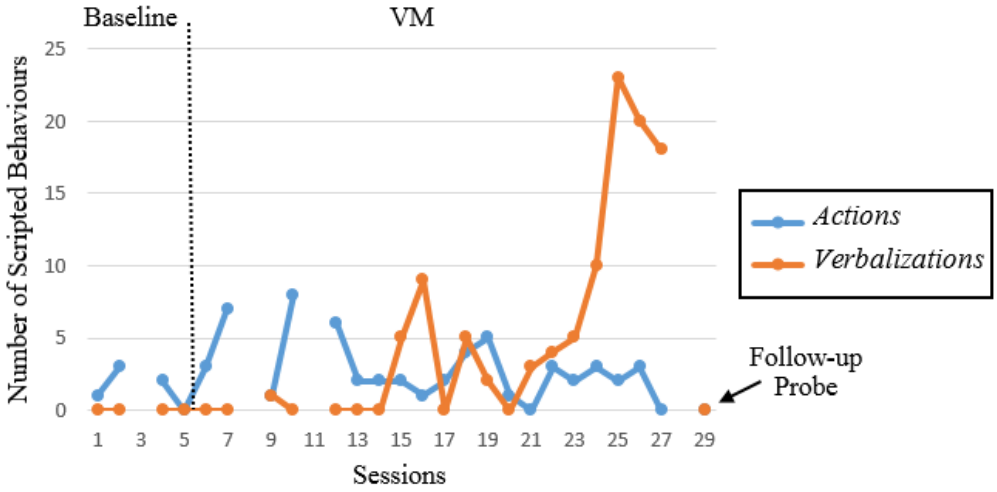
For this play set, the participants were shown the video of mainstream peers playing with the pirates play set, which was filmed from the third-person perspective—video modelling (VM). (See §4.9.1 for a picture of the pirates play set and a listing of the toys available to play with.)

6.2.1.1 **Participant 1 – Zac**

6.2.1.1.1 ***Zac's scripted behaviours for the pirates play set***

The rate of Zac's scripted play actions and verbalizations for the pirate play set are shown in Figure 38.

Figure 38. Zac's scripted play actions and verbalizations for the pirate play set



Following the introduction of the video modelling intervention in session 6, *Zac's scripted play actions* increased from a mean baseline level of 1 (range 0-3) to a mean level of 2 (range 0-8). He demonstrated scripted actions in 21 of the 25 sessions he participated in, which equates to about 85% of total sessions. It should be noted that Zac was absent for four sessions out of the 29 sessions involving this play set. In looking at Figure 38, one will notice that his scripted actions remained within a small number (N=0-8). He demonstrated the highest number of scripted actions during sessions 7, 10, 12, 19 (N=7, 8, 6, 5 respectively). Although there were slight increases in his scripted actions from time to time, his skills returned to his beginning baseline level (N=0) at the last session he participated in prior to the follow-up session. At the follow-up session, which took place three weeks after the intervention ended, he did not demonstrate any scripted actions (N=0).

Table 44. Zac's scripted play actions for the pirate play set

Scripted Play Actions	***Session(s)***
Placed a pirate on the hatch of the ship	1, 2, 6, 12-14, 17, 20, 22-24
Pushed ship as if it was sailing	2
Opened side gang plank	4, 6, 7, 10, 12, 18
Moved pirate onto opened side gang plank	6, 10
Closed side gang plank	13
Opened back door of ship	7, 10, 12
Closed back door to the ship	7, 10
Stood pirate on trap door (behind wheel)	7, 9, 10, 12, 16
Turned wheel with character there	10
Made digging motion with a pirate	14, 18-19, 22, 24-26
Placed a pirate at the front of the ship by the cannon	17

Moved the pirate as he was talking	19
Walked a pirate on the table	19, 22-24
Pulled out the treasure	19

Following the introduction of the video modelling intervention in session 6, the rate of *scripted verbalizations* increased from a mean baseline of 0 (range 0) to a mean level of 5 (range 0-23). He demonstrated scripted verbalizations in 12 of the 25 sessions he participated in, which equates to about 49% of total sessions. Although he did not demonstrate scripted verbalizations in a high percentage of sessions, the number of scripted verbalizations he demonstrated within sessions continued to increase (to as high as 23 within a single session). In looking at Figure 38, in contrast to his scripted actions, he remained at a very low level of scripted verbalizations during the baseline phase through session 14 (N=0-1), However, beginning in session 15, he began a steady climb in his scripted verbalizations. They did dip down to baseline levels in sessions 17 and 20 (N=0), then progressively increased to his highest level in session 25 in which he demonstrated 23 scripted verbalizations. He demonstrated the highest number of scripted verbalizations during sessions 24-27 (N=10, 23, 20, and 18 respectively). These sessions were his last four sessions prior to the follow-up probe. As was with his scripted actions, Zac did not demonstrate any scripted verbalizations at the follow-up session (N=0), which took place three weeks after the intervention ended.

Table 45. Zac's scripted verbalizations for the pirate play set

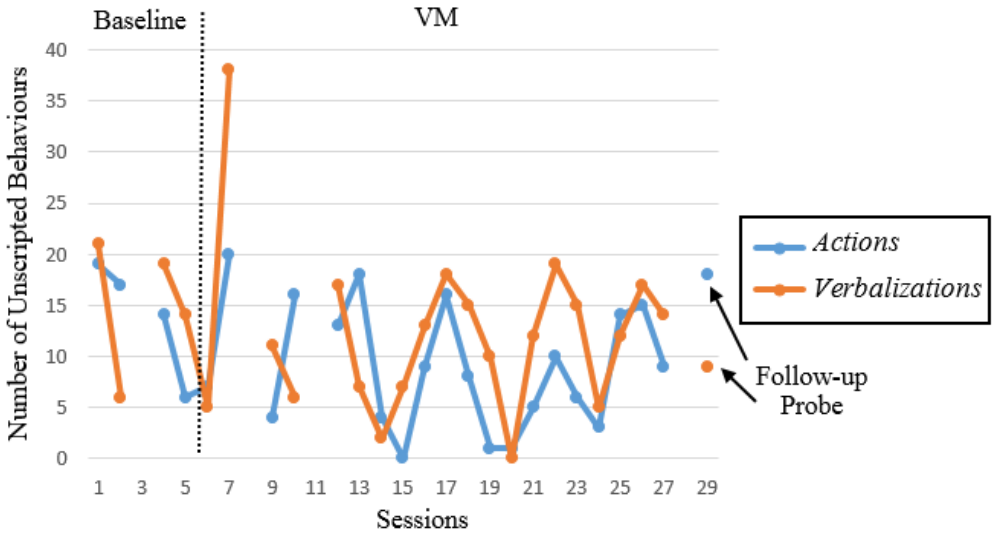
Scripted Verbalizations	***Session(s)***
"Let's dig."	14, 26, 19, 24, 25
Made "Phewt" sound while digging with a pirate.	14, 19, 22, 24-26
"I've hit something!"	14, 24-26
"Let's pull it out."	14, 24-26
"Ugh."	25, 26
"It's the treasure."	14, 16, 25, 26
"Aye, aye, captain."	16
"That was fun."	16
"Yeah, I like playing pirates."	16
"Yeah me too."	16
"You stay on the ship."	18, 25
"Youse two stay on the ship."	16, 18, 25-27
"Guard it."	16
"Let's play pirates."	21-27
"Okay, I'll be the captain."	21-27
"On board mates."	21-27
"We're off to find the treasure."	23-27
"Steer to the right."	23, 25, 27
"Gold, jewels and a crown."	24, 25

“Guard your stations.”	25-27
“Straight ahead.”	25, 27
“We’re nearly there.”	25, 27
“The island is up ahead.”	9, 25-27
“Drop the anchor.”	25-27
“Okay.”	25-27
“Captain, where’s the treasure?”	25, 26
“Follow the map.”	25, 26
“Where is it?”	25, 26
“Here is the tree by the stream.”	25, 26
“Whee!”	25

6.2.1.1.2 ***Zac’s unscripted behaviours for the pirates play set***

The rate of Zac’s unscripted play actions and verbalizations for the pirate play set are shown in Figure 39.

Figure 39. Zac’s unscripted play actions and verbalizations for the pirate play set



Following the introduction of the video modelling intervention in session 6, Zac’s *unscripted play actions* decreased from a mean baseline level of 11 (range 6-19) to a mean level of 8 (range 0-20), following the introduction of the video. In looking at Figure 39, one will find that Zac demonstrated the highest number of unscripted actions during sessions 1, 7, 13 and 29 (N=19, 20, 18, 18 respectively). He demonstrated unscripted actions in 24 out of the 25 sessions he participated in, which equates to about 97% of total sessions. In looking at Figure 39, one will find that there was a lot of variability in his demonstration of unscripted actions, with several ups and downs and not a steady progression in either direction. During his last session of intervention, he demonstrated nine unscripted actions. Whereas at the follow-up session, which took place three weeks

after the intervention ended, he demonstrated 18 unscripted actions, double that of his last intervention session.

Table 46. Zac's unscripted play actions for the pirate play set *

Unscripted Play Actions	***Session(s)***
Actions with the small cannon (shot it, moved it)	1, 2, 5, 13, 17, 27, 29
Actions with the trap door (opened it, closed it)	2, 7, 9, 10, 12, 16, 27
Actions with the hatch door (opened it, closed it, placed pirates in it, removed pirates from inside)	2, 6, 7, 10, 12-14, 17, 18, 26
Moved ship (tilted it, changed its direction, slid it along the table)	2, 4, 5, 10, 13, 16, 22, 25
Animated pirate (shot weapon, hit one into another, moved them on/off various parts of the ship, handed over objects, and crashed them into another pirate)	2, 4-6, 9, 10, 12, 13, 16, 20-27, 29
Placed a pirate in opening under trap door (that is open)	4, 25
Moved the cannon attached to the front of the ship	4, 5, 6, 9, 12
Extended his hand from the cannon attached to the front of the ship, making the "phph" sounds	4, 12
Moved the sail of the ship	4, 18
Placed a piece of the ship back (that had either fallen off or been pulled off)	7, 12, 18
Actions related to back section door (placed a pirate in/out)	7, 10, 16
Handed a pirate to a peer to share	25

** Condensed the information to improve readability. Please see Appendix AA for entire table*

Zac's *unscripted verbalizations* decreased from a mean baseline of 12 (range 6-21) to a mean level of 11 (range 0-38), following the introduction of the video modelling intervention in session 6. In looking at Figure 39, one will find that Zac demonstrated the highest number of unscripted verbalizations during sessions 1, 4, 7 and 22 (N=21, 19, 38 and 19 respectively). He demonstrated unscripted verbalizations in 24 out of the 25 sessions he participated in, which equates to about 97% of total sessions. He demonstrated the same percentage of unscripted verbalizations as he did with unscripted actions. Zac demonstrated a higher level of unscripted actions and unscripted verbalizations, within and across sessions, than those that were scripted. During his last session of intervention, he demonstrated 14 unscripted verbalizations. Whereas at the follow-up session, which took place three weeks after the intervention ended, he demonstrated nine unscripted actions, much less than that of his last intervention session (approximately 40% less).

Table 47. Zac's unscripted verbalizations for the pirate play set *

Unscripted Verbalizations	***Session(s)***
"I was gonna shoot it right over there."	1
"Fire in the hole."	1
"It's so amazing!"	1
"Let's have a shoot out."	4, 9
"The waves are coming."	4
"Don't know where you're going, you baddy."	5
"Oh, I can't use him, he's dead."	5
"Where's the crocodile?"	5
"Whoa, wasn't that awesome?"	7
"Right, I'm going to fire this thing into the ship, men."	7
"Let's go and shoot men."	9
"Whoa the boat is starting to fall, phph, yeow, whoo the boat, oh no!"	13
"You can't dig, can't you, peow, captain?"	15
"I've got no place to hide."	16
"Hey, get down there captain."	17
"You haven't got me for a minute."	21
"Yeah, that's what you get for doing this!"	22
"The ship is falling down in the sea."	22
"In fact, it's time for you two to die."	26
"Okay I, I have a map where the treasure is."	27
"Shoot the three pirates."	29

** Condensed the information to improve readability. Please see Appendix BB for entire table*

6.2.1.1.3 *Zac's qualitative findings for the pirates play set*

After reviewing the videos and their transcriptions for all sessions involved with the pirates play set, several observations can be made about Zac's social behaviours. Zac looked for affirmation from adults during his play. For example in session 1 he said, "Look at this, it's so amazing." He also commented on his own actions. In the same session, he stated, "Oh, I dropped it." He himself became animated during his play. For example, in session 4 while moving the sail of the pirate ship, he moved his own body back and forth as if the ship was in a storm. He also commented on play actions, such as stating, "He's dead" when a pirate was shot by a cannon (session 5). He modified his own play based on cause and effect. For example, in session 7, when the trap door was slid out causing a pirate to fall out of the ship because the back door was open at the time, he stated "Let's try it with the door so this time…" and closed the back door. He showed curiosity in his play by asking questions of peers. For example in session 8, he asked of his peers, "Where's yous two other pirates? Two of them have gone under?" He participated in cooperative play with his mainstream peers during several sessions. For example in session 6, he participated in cooperative play for three minutes, 20 seconds

out of the four minutes of play time with the pirate set. His participation in cooperative play often included his initiating play, joining in on existing play, commenting on the play of his peers, demonstrating pretend play, and using his imagination.

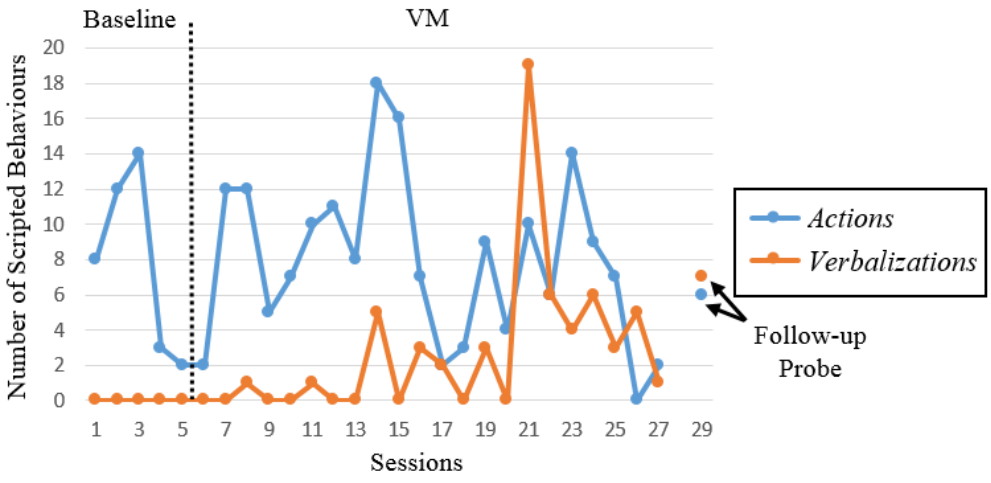
Having analysed Zac's performance with both scripted and unscripted play behaviours, I believe that Zac's involvement in cooperative and imaginative play impacted his demonstration of scripted actions and scripted verbalizations. Although the goal of this intervention was for the participants to imitate scripted actions and scripted verbalizations from the video presentation, it was interesting to see Zac perform social behaviours that had not yet been observed by those working with him. If you will recall from the methods chapter for this experiment (chapter 4 §4.2.2.4.2), Zac preferred to play alone, did not play with toys in class and did not regularly engage with his peers in class. The new social behaviours may be attributed to his exposure to such social situations, as this social skills intervention provided. The mainstream peers were selected because of their cooperative play skills and ability to share. These characteristics only contributed to the social exposure Zac received through this social skills intervention.

6.2.1.2 **Participant 2 - Eli**

6.2.1.2.1 ***Eli's scripted play behaviours for the pirates play set***

The rate of Eli's scripted play actions and verbalizations for the pirate play set are shown in Figure 40.

Figure 40. Eli's scripted play actions and verbalizations for the pirate play set



Following the introduction of the video modelling intervention in session 6, Eli's *scripted play actions* increased slightly from a mean baseline level of 8 (range 2-14) to a mean level of 8 (range 0-18). He demonstrated scripted actions in 27 of the 28 sessions he participated in, which equates to about 97% of total sessions. It should be noted that he was absent for one session out of the 29 sessions involving this play set. He demonstrated the highest number of scripted actions during sessions 3, 14, 15, and 23 (N=14, 18, 16 and 14 respectively). In looking at Figure 40, one will note two sections of increases in his scripted actions following baseline. The can be seen in sessions 7-14 (N=12, 12, 5, 7, 10, 11, 8 and 18 respectively), followed by a drop in skills then a subsequent increase in sessions 18-23 (N=3, 9, 4, 10, 6 and 14 respectively). Although there were increases in his scripted actions from time to time, his skills returned to below his beginning baseline level (N=2) at the last session he participated in prior to the follow-up session. At the follow-up session, which took place three weeks after the intervention ended, he demonstrated six scripted actions, which is lower than the average mean during the intervention phase.

Table 48. Eli's scripted play actions for the pirate play set

Scripted Play Actions	***Session(s)***
Steered wheel	1-3, 7-10, 12-17, 19, 21, 22-25, 27, 29
Opened side gang plank	1-3, 7, 8, 12-15, 18-24, 27, 29
Closed side gang plank	1-3, 7, 12, 14, 16, 19-21, 23, 24, 29
Stood pirate on side gang plank	7, 11, 14, 15, 19
Removed a pirate from the gang plank	7
Opened back door of the ship	1-3, 5, 8, 9, 11-13, 18, 23, 25
Closed back door of the ship	2, 5, 8-13, 16, 23, 29
Placed pirate on trap door behind wheel	2, 3, 5-8, 10, 11, 13-16, 19, 22, 23, 25
Stood pirate on the front of the ship near cannon	3, 10, 11, 17, 21, 22, 29
Stood pirate on the hatch door	4, 8, 11, 12, 14, 15, 18, 21
Placed pirate in look out	8, 10, 16, 25
Walked pirate(s) on the table	14
Moved ship as he steered wheel	14, 15, 19
Moved pirate in a digging motion	15, 21, 22
Walked pirate back to the ship	19, 21

Eli's *scripted verbalizations* increased from a mean baseline of 0 (range 0) to a mean level of 3 (range 0-19), following the introduction of the video modelling intervention in session 6. He demonstrated scripted verbalizations in 14 of the 28 sessions he participated in, which equates to 50% of total sessions. He demonstrated the highest number of scripted verbalizations during sessions 21, 22, 24 and 29 (N=19, 6, 6 and 7 respectively). In looking at Figure 40, unlike with his demonstration of scripted actions, there appeared to be one group of sessions in which there was an increase in his scripted verbalization skills. This occurred over sessions 14-21 (N=5, 0, 3, 2, 0, 3, 0 and 19 respectively), followed by a decrease of skills in sessions 22-27 (N=6, 4, 6, 3, 5 and 1 respectively). At the follow-up session, which took place three weeks after the intervention ended, he demonstrated seven scripted verbalizations, which is higher than the average mean throughout the intervention.

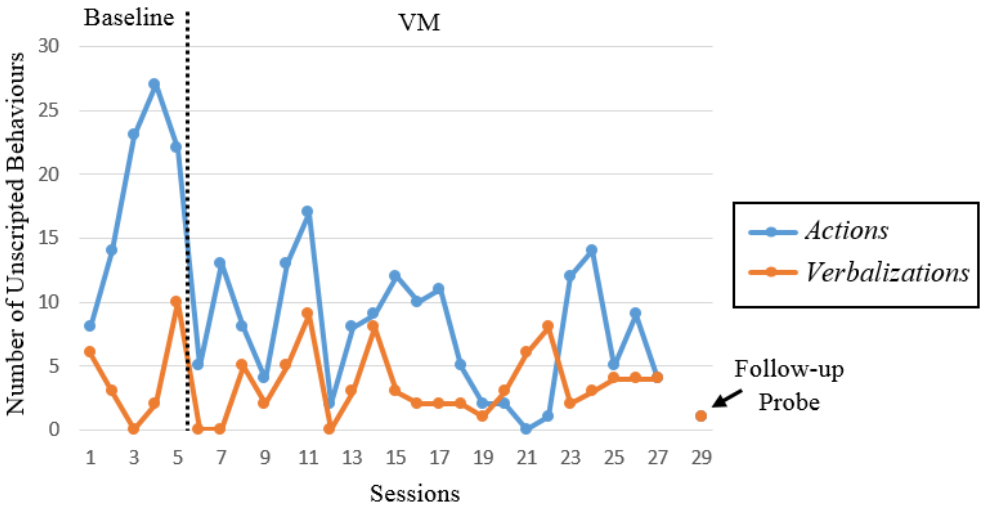
Table 49. Eli's scripted verbalizations for the pirate play set

Scripted Verbalizations	***Session(s)***
"Let's play pirates."	8, 14, 29
"Straight ahead."	11, 21, 23, 25, 26, 27, 29
"Aye, aye Captain."	14
"Yeah, I like playing pirates."	14, 21
"Yeah, me too."	14, 21
"It's the treasure."	16, 21
"Whee!"	16, 19
"Let's go back to the hideout."	16
"The island is up ahead."	17, 19, 21, 24, 26, 29
"Let's pull it out."	19, 21
"On board mateys."	21, 22, 23, 29
"Guard your stations."	21, 22, 24-26
"We're off to find the treasure."	21-26, 29
"We're nearly there."	21-24, 26, 29
"Let's dig."	21, 22
"Ugh!" (while making digging motion)	21, 23
Whistled	21
"Well done playing pirates."	21
"All finished."	21
"Steer to the right."	24
"Drop the anchor."	24
"Okay, I'll be the captain."	29

6.2.1.2.2 *Eli's unscripted play behaviours for the pirates play set*

The rate of Eli's unscripted play actions and verbalizations for the pirate play set are shown in Figure 41.

Figure 41. Eli's unscripted play actions and verbalizations for the pirate play set



Following the introduction of the video (session 6), Eli's *unscripted play actions* decreased from a mean baseline level of 19 (range 5-27) to a mean level of 7 (range 0-14). He demonstrated unscripted actions in 27 of the 28 sessions he participated in, which equates to about 97% of total sessions. He demonstrated the highest number of unscripted actions in sessions 3, 4, 5 and 11 (N=23, 27, 22 and 17 respectively). It should be pointed out that three of these sessions were during the baseline phase. In looking at Figure 41, his demonstration of unscripted actions was quite variable, with several ups and downs. However, there appears to be a downward trend from the baseline to the end of the intervention. At the last session he participated in prior to the follow-up session, he demonstrated four unscripted actions. At the follow-up session, which took place three weeks after the intervention ended, he demonstrated one unscripted action.

Table 50. Eli's unscripted play actions for the pirate play set *

Unscripted Play Actions	***Session(s)***
Actions with the hatch door (opened it, closed it, placed pirates in it, removed pirates from inside)	1-5, 7, 8, 10, 11, 13-17, 20, 23, 24, 26, 29
Actions with the small cannon (loaded it, shot it, and moved it)	2, 3, 4, 17, 18, 25-27
Actions with the trap door (opened it, closed it)	2, 3, 5, 6, 8, 11, 17, 18, 23-25, 27
Animated a pirate (moved him onto the ship and various locations on the ship)	1, 5, 8, 9, 12-16, 19
Moved ship (tilted it, changed its direction)	1, 3, 5, 9, 13, 15-17, 19, 25
Removed a pirate from the back door opening	2, 3, 5, 8-13, 23, 25
Placed parts of the ship back on that fell off	5, 8, 18

Moved front sail	7
Walked a pirate around a group of other pirates	18
Removed flags from the ship	22

** Condensed the information to improve readability. Please see Appendix CC for entire table*

Eli's *unscripted verbalizations* decreased from a mean baseline of 4 (range 0-10) to a mean level of 3 (range 0-9), following the introduction of the video (session 6). He demonstrated unscripted verbalizations in 24 of the 28 sessions he participated in, which equates to about 86% of total sessions. He demonstrated the highest number of unscripted verbalizations in sessions 5, 11, 14 and 22 (N=10, 9, 8 and 8 respectively). In looking at Figure 41, one can see a good amount of variability with Eli's unscripted verbalizations. However, in looking at the numbers decreasing from a mean baseline of 4 (range 0-10) to a mean level of 3 (range 0-9), the numbers overall are within a stable range, neither steadily increasing nor steadily decreasing over time.

Table 51. Eli's unscripted verbalizations for the pirate play set *****

Unscripted Verbalizations	***Session(s)***
"Want to do a treasure…have a pirate."	1
"Joseph and I'm on the pirate."	1
"Going back in the ship, okay bye-bye, jump."	5
"Look out…look out!"	5
"Not that one, he's up here."	5
"Handle my pirate man."	5
"I want…trust me I'm protecting you."	5
"Start this boat."	8
"I like Titanic."	8
"Captain, Captain, come out here."	9
"Let's go back…let's go back here…back, back."	11
"Back to the back of the ship."	11
"I am the captain."	15
"Can have some pirate ship?"	18
"Watch out, the ship is totally broken!"	20
"Dangerous pirate, broken pirate."	20
"I play pirate no more…play pirate ship anymore....is broken."	22
"Watch out for flags…oh no, it's going up in the flags…look, now it's not being flag."	22
"Come on, let's go…come on, let's go."	25
"Look out!"	25
"Fire, fire, fire!"	25, 26
"Excuse me, want some pirate ship."	27
"We're on the ship."	29

** Condensed the information to improve readability. Please see Appendix DD for entire table*

6.2.1.2.3 *Eli's qualitative findings for the pirates play set*

After reviewing the videos and their transcriptions for all sessions involved with the pirates play set, several observations can be made about Eli's social behaviours. Eli appeared to engage in self-directed and parallel play. His play appeared to be more concrete rather than imaginative. His play also appeared simple and not complex or extended. However, he did use a pirate to walk up the steps on the ship while walking the pirate from the middle of the ship to the back (session 5). This action was not modelled in the video. He would request items from peers. For example, he stated, "Excuse me, the pirate ship" (session 4) while pulling the ship towards him. On another occasion (session 8) he stated "Want these and this one" while reaching for and grabbing a pirate that a peer was holding.

Interestingly, in one session (session 27), while he was taking off his jumper, he overheard his peer say, "Drop the anchor". Eli paused in the middle of taking off his jumper and put down the two gang planks on the ship. Although Eli tended to engage in parallel play rather than joining into the existing play of his peers, he responded with the correct action to match the scripted statement that he overheard.

He did imitate a range of scripted actions and verbalizations. Interestingly during session 23, he demonstrated 14 scripted actions. Similarly, during session 21, he stated 19 scripted verbalizations, which was almost the entire script from the pirate video.

Eli's performance throughout this social skills intervention was commensurate with his social skills at that time, according to his teacher and the file review conducted at the beginning of this study. As seen throughout the intervention, Eli tended to engage in parallel play, playing alongside his peers. He did not demonstrate a high level of interest in what his peers were doing. He did not initiate play with his peers nor join in on existing play with his peers. However, he would initiate requests for items that he wanted to play with.

*6.2.2 **Knights and Castle Play Set Results***

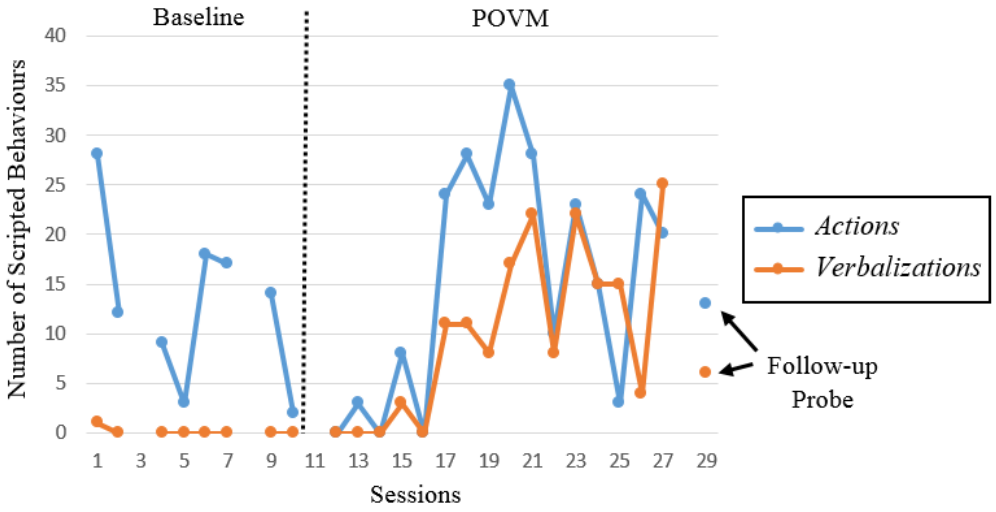
For this play set, the participants were shown the video of mainstream peers playing with the knights and castle play set, which was filmed from the first-person perspective—point-of-view video modelling (POVM). (See §4.9.1 for a picture of the knights and castle play set and a listing of the toys available to play with.)

6.2.2.1 **Participant 1 – Zac**

6.2.2.1.1 ***Zac's scripted play behaviours for the knights and castle play set***

The rate of Zac's scripted play actions and verbalizations for the knights and castle play set are shown in Figure 42.

Figure 42. Zac's scripted play actions and verbalizations for the knights and castle play set



Following the introduction of the point-of-view video (session 11), Zac's *scripted play actions* increased from a mean baseline level of 10 (range 2-28) to a mean level of 14 (range 0-35). He demonstrated scripted actions in 22 of the 25 sessions he participated in, which equates to about 89% of sessions. He demonstrated the highest number of scripted actions in sessions 1, 18, 20, and 21 (N=28, 28, 35 and 28 respectively). In looking at Figure 42, one can see an increase in scripted actions, although variable, across the intervention. An increase can be seen in sessions 17-21, with a dip in session 22, followed by another increase in sessions 23-24, another dip in session 25, followed by another increase in sessions 26-27. On the last session that he participated in prior to the follow-up session, Zac demonstrated 20 scripted actions, which is higher than the average mean throughout the intervention. At the follow-up session, which took place three weeks after the intervention ended, he demonstrated 13 scripted actions, which is just below the average mean for the intervention phase.

Table 52. Zac's scripted play actions for the knights and castle play set

Scripted Play Actions	***Session(s)***
Loaded the small cannon	1, 4, 6, 7, 9, 13, 15,

	17-22, 26, 27
Shot the small cannon off the castle roof	1, 4, 13, 15, 17, 18, 20-23, 25-27
Loaded the catapult	1, 2, 5-7, 9, 15, 18-24, 26, 27, 29
Shot the catapult	1, 2, 5-7, 9, 10, 15, 18-27, 29
Stood a knight next to the catapult	6, 26
Stood a knight behind the small cannon	23, 25
Loaded the large cannon	2, 7, 9, 17, 20, 24, 26
Shot the large cannon	7, 9, 17, 19, 20, 24, 29
Closed the side drawbridge	2, 10, 19
Put both hands to his mouth (in a cupped position) while making the trumpet sound	17, 22-24, 27
Brought ladder up and over the castle to the back	21, 24, 25, 27, 29
Walked a knight up the ladder	27, 29

Zac's *scripted verbalizations* increased from a mean baseline of 0 (range 0-1) to a mean level of 9 (range 0-25), following the introduction of the point-of-view video (session 11). He demonstrated scripted verbalizations in 14 of the 25 sessions he participated in, which equates to about 56% of sessions. He demonstrated the highest number of scripted verbalizations in sessions 20, 21, 23 and 27 (N=17, 22, 22 and 25 respectively). In looking at Figure 42, there is a steady increase in scripted verbalizations from sessions 17-27. He demonstrated the highest number of scripted verbalizations in session 27 (N=25). However, at the follow-up session, which took place three weeks after the intervention ended, he only demonstrated six scripted verbalizations, which is less than the average mean during the intervention phase.

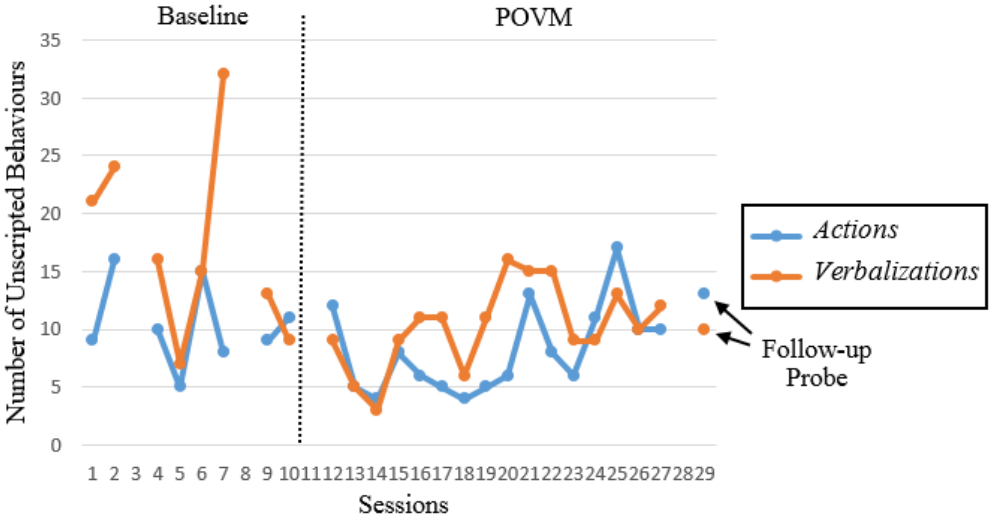
Table 53. Zac's scripted verbalizations for the knights and castle play set

Scripted Verbalizations	***Session(s)***
"Let's play knights."	21, 23-27
"Okay."	23-25, 27
"Sound the trumpet."	17, 22-25, 27
"The enemy is approaching."	20, 21, 23, 27
"On my count."	17, 21, 24, 25, 29
"Ready, aim, fire."	15, 17-27, 29
Made the trumpet sound.	17, 21-24, 27, 29
"Close the doors."	21, 24, 27
"Well done men."	22, 23
"Pull up the ladder."	24, 25, 27, 29
"Zac command the small cannon."	25, 27, 29
"John, Leon, go to the top."	27
"The enemy is gone."	27

6.2.2.1.2 ***Zac's unscripted play behaviours for the knights and castle play set***

The rate of Zac's unscripted play actions and verbalizations for the knights and castle play set are shown in Figure 43.

Figure 43. Zac's unscripted play actions and verbalizations for the knights and castle play set



Following the introduction of the point-of-view video (session 11), Zac's *unscripted play actions* slightly decreased from a mean baseline level of 8 (8.3) (range 5-16) to a mean level of 8 (7.94) (range 4-18). He demonstrated unscripted actions in all of the sessions he participated in. He demonstrated the highest level of unscripted actions in sessions 2, 6, 25 and 21 (N=16, 15, 17 and 13 respectively). However, although his unscripted play actions slightly decreased in range over the course of the intervention (from a range of 5-16 to a range of 4-18), the numbers overall are within a stable range, neither steadily increasing nor steadily decreasing over time. On the last session that he participated in prior to the follow-up session, Zac demonstrated 10 scripted actions, which is higher than the average mean throughout the intervention. At the follow-up session, which took place three weeks after the intervention ended, he demonstrated 13 scripted actions, which is also higher than the average mean throughout the intervention.

Table 54. Zac's unscripted play actions for the knights and castle play set *

Unscripted Play Actions	***Session(s)***
Shot small cannon at another object (knight, castle, window, other cannon, or castle doors)	6, 7, 9, 13, 19, 24, 26
Shot big cannon at another object (knight, castle, window, other cannon or castle doors)	20, 26

Pushed on catapult to shoot it (with a different object in it such as the small cannon ball or a knight)	1, 9, 25
Shot catapult that was empty	29
Moved small cannon to various places on/in the castle	6, 15
Placed small cannon inside big cannon to shoot it	17
Placed a knight in the catapult to shoot it	1, 2, 9
Animated knight (his arms, weapon, flew him in the air, placed him on various locations of the castle)	1, 2, 4-7, 9, 10, 12-17, 20, 22-25, 27, 29
Crashed knight into another knight or object	2, 5, 10, 12, 15, 16, 18, 21, 22, 25, 29
Opened side drawbridge	2, 27
Actions involving a ball (small cannon, big cannon, or catapult) (flew it into the air, placed it in various locations within the castle)	2, 4, 6, 7, 15, 19, 20, 23, 24, 25, 29
Opened and/or closed the doors to the castle	2, 6, 18, 27
Moved the castle and/or its parts (as if under fire)	6, 9, 19, 26
Moved a knight to approach another knight	9, 10, 21, 26
Actions with the ladder (placed it inside the doors, leaned it against the castle)	21, 22, 24, 25, 27, 29
Handed a knight to a peer	26

** Condensed the information to improve readability. Please see Appendix EE for entire table*

Zac's *unscripted verbalizations* decreased from a mean baseline of 14 (range 7-32) to a mean level of 10 (range 3-16), following the introduction of the point-of-view video (session 11). He demonstrated unscripted verbalizations in all of the sessions he participated in. He demonstrated the highest level of unscripted verbalizations in sessions 1, 2, 4 and 7 (N=21, 24, 16 and 32 respectively). In looking at Figure 43, one will note the decrease of unscripted verbalizations from the baseline phase to the intervention phase (from a range of 7-32 to a range of 3-16). However, the numbers remained within a stable range following the introduction of the video (from sessions 12 forward). On the last session that he participated in prior to the follow-up session, Zac demonstrated 12 unscripted verbalizations. At the follow-up session, which took place three weeks after the intervention ended, he demonstrated 10 unscripted verbalizations.

Table 55. Zac's unscripted verbalizations for the knights and castle play set *

Unscripted Verbalizations	***Session(s)***
"Fire!"	1, 2, 4-6, 9, 13, 17, 24-25, 29
"Phph." (a firing sound)	1, 2, 4-7, 9-10, 12-15, 23-25, 27, 29
"Oh, a guard fell off…a guard fell…look a guard fell off…I said a guard fell off!"	1
"It went over the castle and shoots over the table."	1

“Fire him off…lights out big fella.”	2
“Whoa…ah, he’s dead.”	2
“Kachung, there’s too much fire around.”	2
“Come on, give up…us want us…gets us man.”	2
“I thought I just killed you.”	4
“This is in that…let’s try and do it in this…you need something...yeah, watch.”	7
“Let’s see which one fires the most.”	7
“Okay, both of them on the wall. I want to fire and shoot at something.”	7
“Cool, watch, watch, watch this!”	7
“We need to destroy the black ones.”	9
“Guard sir, don’t have no more bullets.”	13
“It’s going to fall.”	13
“Which one are you being?”	14
“We need a ball…give me a ball!”	15
“Zac, how dare you kill my friend…I’m going here to save you.”	15
“I’m killing him.”	15
“You think you’re comin’…you’re wrong boy…what’s a matter with you…are you hurt or something…no I’m not hurt or something…so you’re just like a___.”	16
“He tricked me.”	16
“Why are you firing him?”	17
“Ready…well if you’re ready or not…ready and fire.”	18
“Load cannons.”	19
“Where is the trumpet?”	19
“Why’s castle falling?...castle’s falling”	19
“Ready and fire the ladder.”	21
“Come out…we left some men…uh uh…let us out.”	21
“No I’m the k…we are the king of the castles.”	21
“Up the ladder…up me the ladder.”	21
“You’re the enemy, that’s why.”	22
“Destroy the ladder.”	22
“I’m inside…I’m inside the top of the castle.”	25
“Destroy the castle!”	26
“Come on, let’s get them!”	26
“Open the doors.”	27

** Condensed the information to improve readability. Please see Appendix FF for entire table*

6.2.2.1.3 ***Zac’s qualitative findings for the knights and castle play set***

Similar to the findings with the pirates play set, Zac showed emotion while playing with the knights and castle play set. For example in session 25, he raised his arms in the air while stating, “That was…now that was awesome.” He had just simultaneously shot the small and large cannons as well as the catapult. He also used characters as agents in his play. For example, he used a knight to push the button on the small cannon to shoot it

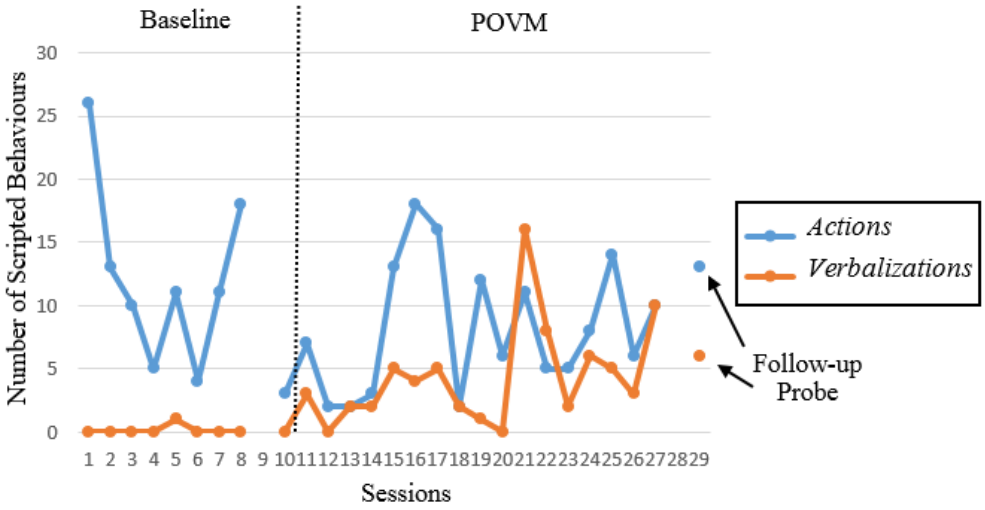
(sessions 4 and 24). He used his imagination as well by putting the knight into the catapult to shoot him rather than the cannon ball (session 1).

6.2.2.2 **Participant 2 – Eli**

6.2.2.2.1 ***Eli's scripted play behaviours for the knights and castle play set***

The rate of Eli's scripted play actions and verbalizations for the knights and castle play set are shown in Figure 44.

Figure 44. Eli's scripted play actions and verbalizations for the knights and castle play set



Following the introduction of the point-of-view video (session 11), Eli's *scripted play actions* decreased from a mean baseline level of 10 (range 3-26) to a mean level of 9 (range 2-18). He demonstrated scripted actions in 27 sessions (all sessions he participated in). He demonstrated the highest number of scripted actions in sessions 1, 8, 16 and 17 (N=26, 18, 18 and 16 respectively). In looking at Figure 44, one can see quite a lot of variability in his demonstration of scripted play actions. However, a higher level of variability is noted during the baseline phase (sessions 1-10). Although his scripted actions decreased slightly from the baseline phase to the end of the intervention, there is a variable, yet steady increase in his scripted actions throughout the intervention phase (sessions 11 forward). On the last session that he participated in prior to the follow-up session, Eli demonstrated 10 scripted actions. At the follow-up session, which took place three weeks after the intervention ended, he demonstrated 13 scripted actions, which is higher than the average mean throughout the intervention phases.

Table 56. Eli's scripted play actions for the knights and castle play set

Scripted Play Actions	***Session(s)***
Loaded small cannon	1-5, 7, 11, 12, 15, 19, 21, 23, 27, 29
Shot small cannon off the castle roof	1, 2, 5, 11, 15, 16, 21, 23, 27, 29
Loaded catapult	1, 3, 7, 8, 15-17, 19, 24, 25
Shot catapult	3, 7, 8, 13-17, 19, 20, 22, 24, 25
Loaded large cannon	1, 7, 17, 20, 25, 26
Shot large cannon	1, 7, 10, 20, 25
Closed side drawbridge	1, 4, 5-8, 11, 13-16, 19, 21, 22, 24, 27
Closed the front doors to the castle	1-8, 11, 12, 14, 19, 22-24, 26, 27, 29
Put both hands to his mouth (in a cupped position) while making the trumpet sound	15-19, 21-27
Brought ladder up and over the castle to the back	17
Walked a knight up the ladder	1, 2, 8, 27

Eli's *scripted verbalizations* increased from a mean baseline of 0 (range 0-1) to a mean level of 4 (range 0-16), following the introduction of the point-of-view video (session 11). He demonstrated unscripted actions in 17 out of the 27 sessions he participated in, which equates to about 63% of sessions. He demonstrated the highest number of scripted verbalizations in sessions 21, 22, 24 and 27 (N=16, 8, 6 and 10 respectively). In looking at Figure 44, one will note a flat baseline, followed by an increase of scripted verbalizations over the intervention phase (session 11 forward). On the last session that he participated in prior to the follow-up session, Eli demonstrated 10 scripted verbalizations, which is higher than the average mean throughout the intervention. At the follow-up session, which took place three weeks after the intervention ended, he demonstrated six scripted verbalizations, which is still higher than the average mean throughout the intervention phases.

Table 57. Eli's scripted verbalizations for the knights and castle play set

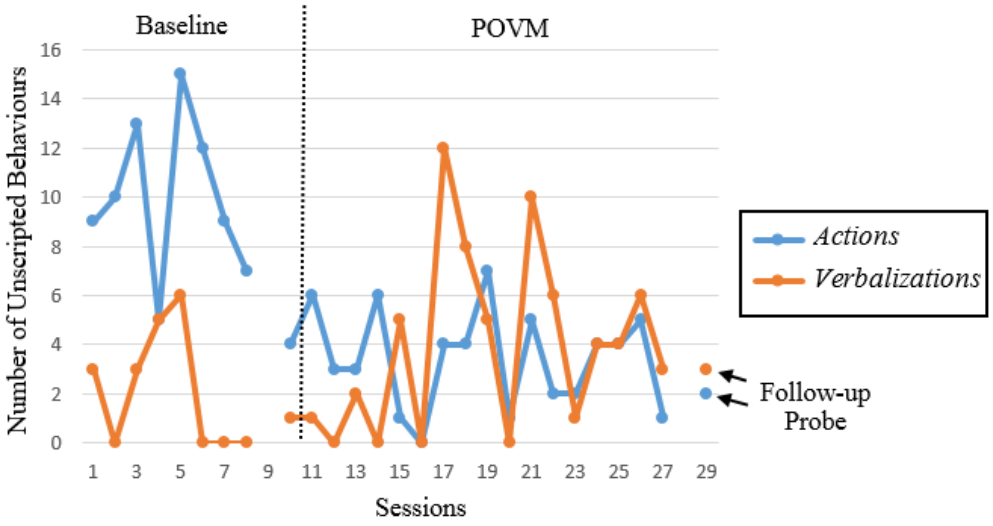
Scripted Verbalizations	***Session(s)***
"Let's play knights."	11, 13, 14, 22
"Okay."	21
"Sound the trumpet."	21, 25, 27
"The enemy is approaching."	25, 26, 27, 29
"On my count."	21, 24, 27, 29
"Ready, aim, fire."	13, 15, 16, 21, 24,

	27, 29
Makes trumpet sound.	14-20, 22-26, 29
"Close the doors."	21, 22, 24, 27
"Well done men."	21
"John, Leon, go to the top."	25, 26, 27
"The enemy is gone."	18, 21-24
"Well done playing knights."	11
"All finished."	11
"That was cool!"	21
"Get all cannons."	24, 26

6.2.2.2.2 ***Eli's unscripted play behaviours for the knights and castle play set***

The rate of Eli's unscripted play actions and verbalizations for the knights and castle play set are shown in Figure 45.

Figure 45. Eli's unscripted play actions and verbalizations for the knights and castle play set



Following the introduction of the point-of-view video (session 11), Eli's *unscripted play actions* decreased from a mean baseline level of 8 (range 4-15) to a mean level of 3 (range 0-7). Eli demonstrated unscripted actions in 26 out of the 27 sessions he participated in, which equates to about 98% of sessions. He demonstrated the highest number of unscripted actions in sessions 2, 3, 5 and 6 (N=10, 13, 15 and 12 respectively). In looking at Figure 45, one will note that his highest number of unscripted actions occurred in the baseline phase (sessions 1-10). Following the introduction of the video, his unscripted actions continued to decrease, while variable. On the last session that he participated in prior to the follow-up session, Eli only demonstrated one unscripted action. At the follow-up session, which took place three weeks after the intervention

ended, he demonstrated two scripted actions, which is lower than the average mean throughout the intervention.

Table 58. Eli's unscripted play actions for the knights and castle play set *

Unscripted Play Actions	***Session(s)***
Opened/closed doors of the castle	1, 2, 3, 4-7, 8, 10-12, 14, 17-19, 22-24, 26, 27, 29
Opened side drawbridge	1, 2, 4-8, 10, 11, 13, 14, 17, 19, 22-24
Shot small cannon at another object (knight, castle, window, other cannon, or castle doors)	3, 4, 5, 7, 11, 12, 21
Shot big cannon at another object (knight, castle, window, other cannon or castle doors)	7
Tried to shoot the big cannon with a different object in it (such as the small cannon ball or a knight)	1
Tried to shoot the catapult with a different object in it (such as the small cannon ball or a knight)	25
Flew a ball (small cannon, big cannon, or catapult) into the air	1, 15
Placed the knight in the big cannon to shoot it	1
Placed small cannon ball in the big cannon to shoot it	1
Placed small cannon ball in the catapult to shoot it	25
Leaned ladder against the front of the castle	2, 7, 8, 10, 12, 14, 17, 18, 20
Put knight through roof door to go downstairs	2, 6
Put a knight through the front doors	3
Placed flags in different locations on the castle	3
Turned the castle around to face him/or closer to him	5, 13, 19, 21
Hit small cannon ball on the castle	5
Walked a knight down the ladder	8
Moved flag stand to the right of the castle	10
Reattached door	13
Leaned forward and looked through front doors	14
Pushed a ball through the front doors of the castle	18, 19, 26
Threw ball by hand towards the front doors	26
Took big cannon from peer	24
Took small cannon ball from a peer	25
Moved big cannon on to the table	25
Placed small cannon inside the front doors, facing outwards	29

** Condensed the information to improve readability. Please see Appendix GG for entire table*

Eli's *unscripted verbalizations* increased from a mean baseline of 2 (range 0-6) to a mean level of 4 (range 0-12), following the introduction of the point-of-view video (session 11). He demonstrated unscripted verbalizations in 19 of the 27 sessions he participated in, which equates to about 71% of sessions. He demonstrated the highest number of

unscripted verbalizations in sessions 17, 18 and 21 (N=12, 8 and 10 respectively). In looking at Figure 45, one will note that during the baseline phase, his numbers peaked once then reduced to zero for several sessions (6-8). Following the introduction of the video, his numbers peaked five times, showing quite a bit of variability and a slight increase. On the last session that he participated in prior to the follow-up session, Eli demonstrated three unscripted verbalizations. At the follow-up session, which took place three weeks after the intervention ended, he also demonstrated three scripted verbalizations.

Table 59. Eli's unscripted verbalizations for the knights and castle play set *

Unscripted Verbalizations	***Session(s)***
"Fire."	4, 5, 11, 21, 24
"Yes."	1
"Let them outside."	1
"Whee!"	1
"He's missed um one."	3
"Get the flag, the flags…flags!"	3
"Uh oh, watch this, falling flags."	3
"Need some castle, not some ball."	4
"Come on you not give to me."	4
"Give it to me."	4
"No!"	4
"Whoa, fire!"	5
"We'll be lying downstairs, downstairs, downstairs, downstairs."	5
"No this way."	5
"Okay, want to turn it please."	5
"Load and fire."	5
"Oh no, doors shut."	5
"Flag stand stays here."	10
"No, not in your castle Eli."	13
"Oh door."	13
"And fire."	15, 21, 24
"Trumpet."	16
"Excuse me boy…boy…boy…play trumpet…trumpet."	16
"Um, excuse me boy…boy what ya doing?"	16
"Need some trumpet…that boy."	16
"Boy some trumpet."	16
"Um trumpet, trumpet."	16
"Excuse me …excuse me…Sean…Sean, Leon…what you doing?...come on…excuse me…some trumpet."	18
"Come on."	18
"Some castle please."	19
"Cannon."	21
"Some castle."	21
"Count."	21

“Check your knights.”	22
“Load ____ cannons.”	23
“Guys.”	24
“Eli’s turn.”	24, 26
“Load the cannons.”	25
“Some this one.”	26
“Give back to me…give back to me now!”	26
“Press red button and go.”	26
“You our cannon.”	27
“____ bridges.”	27
“Load the cannons.”	29
“John, Lee…”	29

** Condensed the information to improve readability. Please see Appendix HH for entire table*

6.2.2.2.3 ***Eli’s qualitative findings for the knights and castle play set***

Similar to the findings for the pirates play set, Eli participated in parallel play with the knights and castle play set, rather than cooperative play. He also engaged in simple play rather than complex or extended play. Similarly, he did not join into the existing play of his peers. Rather he would play on his own and was self-directed. Typically, he only engaged with peers to request an item to play with or to request that the peers sound the trumpet.

Eli appeared to enjoy the sounding of the trumpet as seen in the video. He would put both hands to his mouth (in a cupped position) to make the sound of the trumpet. As the sessions continued he would say, “Sound the trumpet” (sessions 21, 25, 27). He imitated cupping his hands while sounding the trumpet (sessions 15-19 and 21-27). Almost at the beginning of each session, he asked his mainstream peers to sound the trumpet. He would then join them in sounding it (sessions 16, 18, 19, 21, 22, and 25-27). He would ask them to sound the trumpet in various ways as can be seen above in Table 59 for unscripted verbalizations. Just to name one, in session 21, he stated, “Excuse me…some trumpet…sound the trumpet…excuse me Sean…excuse me…sound the trumpet”. Similar to the findings for the pirates play set, Eli demonstrated an action that was not modelled in the video. He walked knights in through the front doors of the castle (session 3).

6.2.3 ***Space Play Set Results (Control Group)***

The play set used for the control group was completely new to the students. Students played with the toys in this set for four minutes alongside their mainstream peers. The participants did not watch any video or receive any specific instructions prior to their play

with this play set. Following the prompt to play, participants and their mainstream peers played with the play set for four minutes. (See §4.9.1 for a picture of the space play set and a listing of the toys available to play with.)

As this play set did not have a video presentation, a script was not developed. However, a list of 21 functional play actions for this play set was created. They can be found in Table 60 below.

Table 60. Functional play actions for the space play set

1	Stood astronaut on the moon
2	Flew astronaut in the air
3	Flew shuttle in the air
4	Landed the shuttle
5	Placed shuttle on the moon
6	Held astronaut next to the rocket
7	Flew rocket in the air
8	Landed the rocket
9	Placed rocket on the moon
10	Drove truck
11	Placed sign on the moon
12	Placed flags on the moon
13	Placed moon rock on the moon
14	Drove the shuttle on the table
15	Opened doors of the shuttle
16	Closed doors of the shuttle
17	Placed astronaut in open doors/next to the shuttle
18	Placed lunar lander on the moon
19	Flew lunar lander
20	Animated astronaut (with movement - walking on table, moving arm, or tool)
21	Animated astronaut (with speech)

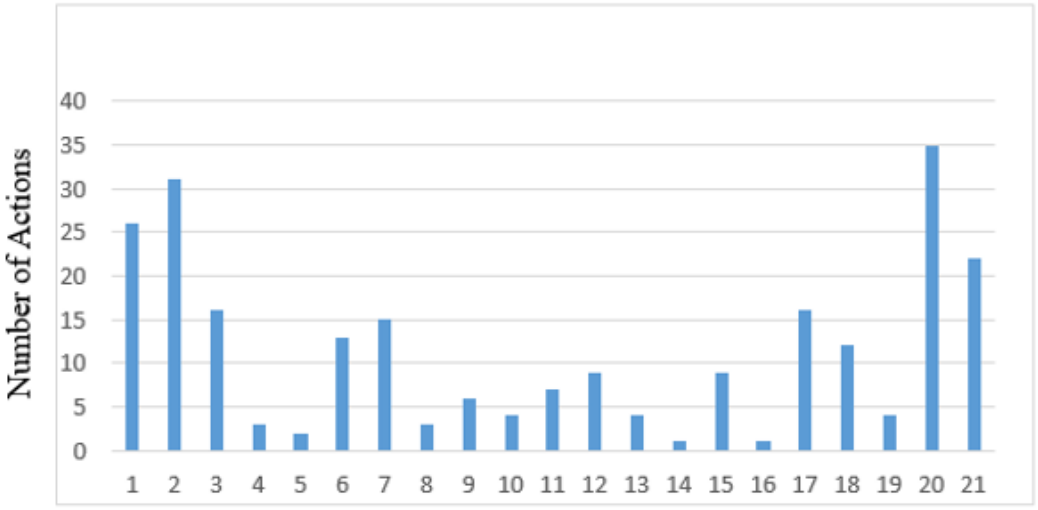
6.2.3.1 **Participant 1 – Zac**

6.2.3.1.1 ***Zac's functional play actions for the space play set***

The rate of Zac's functional play actions for the space play set are shown in Figure 46 below. Over the course of 28 sessions, Zac demonstrated 239 functional play actions. He demonstrated the highest number of the following actions: animated an astronaut through movement (15%; N=35), flew an astronaut in the air (13%; N=31), stood an astronaut on the moon (11%; N=26), animated an astronaut with speech (9%; N=22), flew the shuttle

(7%; N=16), flew an astronaut next to the shuttle (7%; N=16), and flew the rocket (6%; N=15). Other actions were demonstrated with a range from 0-5% (N=1-12).

Figure 46. Zac's functional play actions for the space play set



6.2.3.1.2 ***Zac's verbalizations for the space play set***

Zac demonstrated verbalizations in each session he participated in as reflected in the table below (Table 61).

Table 61. Zac's verbalizations for the space play set *

Zac's Verbalizations	***Session(s)***
"Why does everyone no want to play with me cause no one plays with me."	1
"I'm going to take off now."	1
"I can have a ship. Can I borrow your ship Eli?"	1
"I'm gonna shoot you with my gun!"	1
"Why is he not even shooting?"	1
"At the ship. Phh."	1
"Let me out!"	1
"You want power come back and fight like a man!"	2
"Not good enough Shellington!"	2
"Coming for you!"	2
"Hey you, phh, phh!"	2
"Like yeah, you done now."	2
"Look not so nice huh?"	2
"What happened? What happened to his gun?"	2
"Let's go to the moon."	4
"We left your man there."	5
"On your marks, get set, fork it."	6
"What now ____ get on the moon please so quick aah."	7
"What's going on?"	7

“Let’s go okay?”	7
“Now that’s what I’m going to the moon.”	7
“Hey what you guys doing?”	7
“How? I don’t see him on any space ship.”	9
“I am an astronaut.”	9
“Blast off.”	9
“We’re in space.”	9
“Do you wanna play a moon rock?”	10
“What are ya supposed to do with the moon rock?”	10
“Huh, we dropped a bomb.”	12
“Quick before the bomb.”	12
“Hey put him in there. You can’t. You can put him on.”	13
“There’s no Mars. There’s no Mars there.”	13
“Where’s the flag. Where’s the flag?”	14
“You can’t put it on. You’re not allowed to put the flag on.”	14
“What are these supposed to do for?”	14
“You can pretend. You can pretend.”	14
“Know that the astronauts not go in the rocket.”	14
“Where’s your boys?”	14
“What are you two doing here?”	14
“Hand me the rocket.”	15
“You gotta put him on the rocket. Inside the rocket.”	15
“Why can’t it go in the rocket? You’ve got to pretend.”	15
“You can’t. You can’t fool me.”	15
“Well how are you astronaut?	16
“Well I’m fine moon rock.”	16
“Well I don’t care ____ astronaut. Whoever you are.”	16
“You made us crash…crash…ahh.”	16
“Yeah, we’re flying…yeah.”	16
“We are not on the moon yet.”	16
“Wah. Help I’m stuck. Help me. Help!”	16
“Ah, I’m on the wing.”	16
“Ha I want to be the two astronauts. I just don’t want to be __.”	16
“Bye. Help me up. Help me get up. Help me up.”	16
“He’s not, he’s not riding it any more. No.”	17
“Hey, you forgot our men.”	17
“Ah, he’s dead cause you left him there.”	17
“What’s inside that rocket?”	17
“Airplane rocket ran out.”	17
“Hey, put that out of the moon.”	18
“Yeah, and the thief got out with the moon.”	18
“Right here. The rocket wins. Right here.”	19
“Let’s go back to the hide out John.”	19
“Agh, woah. Bye bye astronaut.”	20
“No, I’ve been aw but I didn’t want only one astronaut.”	20
“Help me, help. Ah, I’m fallin. Help me!”	21
“Do you know what… Where’s the black thing that goes…?”	21
“Hey, here. Do you want to take a moon rock home?”	21
“Hey you want to go to the moon?”	23
“John it was me. John it was me.”	24
“You stuck. You stuck a man there.”	25

“You can’t get him off.”	25
“Okay, I’ll be the thin piece.”	26
“Help. Someone call help.”	26
“Aw we’re two tie up. Phh.”	26
“Come on Corgy, come on.”	26
“Is that a real moon? Is that a real one? Is that a real one?”	28
“What youse two doing in the moon?”	28
“Then where’s the Mars uh?	28
“You gotta pretend its Mars.”	28
“I’m on Mars. On Mars. Ooh Mars.”	28
“Where’s, why you saying Jupiter?”	28
“You are there as well.”	28

** Condensed the information to improve readability. Please see Appendix II for entire table*

6.2.3.1.3 ***Zac’s qualitative findings for the space play set***

While playing with the space play set, Zac demonstrated imaginative play. He joined in on existing play of his peers. He initiated play with his peers and responded to invitations to join their play. He demonstrated the ability to ‘pretend’ in his play. This could be seen when he held an astronaut next to the shuttle and rocket while flying it. He also made references to Mars, pretending the location of Mars was there among the toys being played with. For example in the follow up session, he stated, “You gotta pretend it’s Mars.”

In the first session, he appeared to strategize or to make a plan on how to play with the items. He asked for the shuttle saying, “Right, let’s” and “Hey, I got an idea.” He was inquisitive in his play. He asked questions of his peers, such as “Where’s Mars like?” and “Is that Mars?” In the ninth session, he asked peers how to fly the astronaut with the rocket.

At times, he would try to join into the existing play of his peers unsuccessfully. For example, in session 9 he tried to join in by crashing into their play. A peer responded by pretending to cut his rocket in two. Zac responded with “Aw sorry” then returned to play on his own. On another occasion (session 10), he tried to engage his peers by asking, “Wanna play a moon rock?” When the peers did not respond, he tried again with “What are you supposed to do with the moon rock?” This showed his persistence and willingness to follow-through.

Similar to his play behaviours with the other play sets, he animated the characters while talking for them. He referred to his astronaut on the wing stating, “Ah, I’m on the wing”

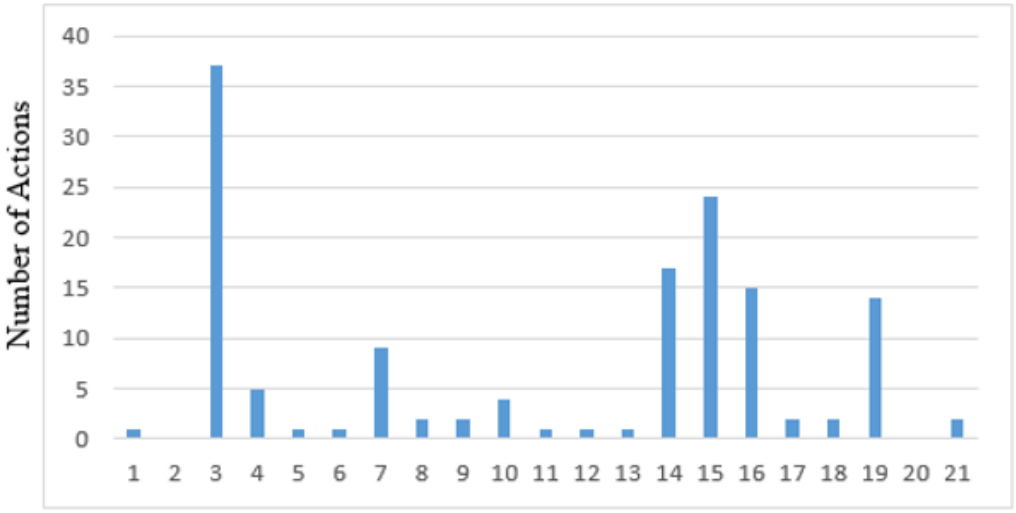
(session 16). In the same session, he demonstrated some expansion of play with the characters. He played out a sequence of steps from flying the astronaut with the shuttle to then landing it on the moon. Similarly in session 20, he showed creativity in his play by standing the astronaut on the wing of the shuttle. He moved the shuttle while flying it pretending the astronaut was falling off the wing. He then placed the astronaut inside the doors of the shuttle. He then repeated this sequence of steps as if running through his own script of play.

6.2.3.2 **Participant 2 – Eli**

6.2.3.2.1 ***Eli's functional play actions for the space play set***

The rate of Eli's functional play actions for the space play set are shown in Figure 47 below. Over the course of 28 sessions, Eli demonstrated 141 functional play actions. He demonstrated the highest number of the following actions: flew the shuttle (26%; N=37), opened the doors on the shuttle (17%; N=24), drove the shuttle (12%; N=17), closed the doors to the shuttle (11%; N=15), flew the lunar lander (10%; N=14), flew the rocket (6%; N=9), and landed the shuttle (4%; N=5). Other actions were demonstrated with a range from 0-3% (N=0-4).

Figure 47. Eli's functional play actions for the space play set



6.2.3.2.2 ***Eli's verbalizations for the space play set***

Eli demonstrated verbalizations in each of the sessions he participated in, as reflected in the table below (Table 62).

Table 62. Eli's verbalizations for the space play set *

Eli's Verbalizations	***Session(s)***
"____ video game."	1
"Phh."	1, 7, 8
"Rocket."	1
"The V ship."	1
"Whoah ____. "	1
"____ guys, play space."	1
"Ah space."	1
"Here rocket."	1
"The rock."	1
"Shhh." (flying sound)	2
"Playing airport and space to the moon."	2
"Aah, aah."	3
"Watch, watch, watch it!"	3
"Watch, watch, watch!"	3
"Here we go, here we going on a ____."	4
"I'm gonna do."	5
"Spider."	6, 20
"Look the spider. "	6
"It's a spider."	6
"Phew!"	7, 12, 14, 15
"That spider, spider."	8
"Some plane."	8
"Aah!"	8
"You left without me." (twice)	9
"Spider, spiderman, spiderman."	9
"Excuse me, the plane."	10
"Have a spider."	11
"Want some plane, want some plane please. Want some plane."	11
"Yeah."	11
"Aah, wa."	12
"Come on."	12
"Year un." (flying sound)	14
"Yes."	14
"Yulp." (pretending to eat something)	15
"Aw."	16
"Two three."	16
"Have some three mans. Three mans."	16
"Three mans."	16
"Not this one. This one."	16
"USA not this one."	17
"Took off space."	17
"Yearoon." (flying shuttle)	17
"Ooh ooh!"	18
"Excuse me."	18
"Pardon."	18
"Not!"	19
"No!"	19
"Excuse me."	19

“Excuse me two. Some two please.”	20
“Zac some two.”	20
“Some share please.”	20
“Ugh. I’m stuck look.”	21
“Ugh.”	21
“Why.”	21
“Ada ado ado ada.” (jingle)	21
“Woah, woah, woah.”	22
“No this. Some this one.”	23
“N want this one.”	23
“Not this one. N this one.”	23
“This one.”	23
“Some this one.”	23
“No, no ooh!”	24
“Excuse me Zac un this one.”	24
“Want space.”	24
“Want this, this one.”	24
“Not this one. Give me this one.”	24
“Oh, oh my _ _ _.”	24
“Ha ha ha ha.”	25
“Uh uh.”	25
“Okay.”	26
“Ahh.”	26
“Rock.”	27
“Shew.” (flying shuttle)	27

** Condensed the information to improve readability. Please see Appendix JJ for entire table*

6.2.3.2.3 ***Eli’s qualitative findings for the space play set***

While playing with the space play set, Eli did not appear to be aware of his peers’ actions. Similar to the findings with the other play sets, he participated in parallel play. He did appear to be at a loss with this play set, as if he did not know how to interact with the toys in front of him. His play was more concrete rather than imaginative. He also did not expand his play with this play set.

He played mostly on his own with the shuttle and rocket. He opened and closed the doors on the shuttle and flew both the shuttle and the rocket in the air. He did not use the astronauts in his play with the shuttle or rocket, with the exception of session 21. In this session, he did place an astronaut inside the doors of the shuttle and stated, “I’m stuck, look.” Typically the only interaction he had with the astronauts was to line them up next to each other. In fact, with this play set, Eli would often line up objects, whether they were the astronauts or the space signs and would look at them in a row (sessions 2, 10, 11, 13, 17-19, 22 and 29).

In session 8, the only interaction Eli had with his peers was to request the shuttle, saying, "some plane". In session 11, he asked his peers for the shuttle, otherwise he did not have any interaction with them. Similarly in sessions 12 and 21, he did not have any interaction with his peers.

Interestingly, with this play set, when left to his own devices in creating his play, Eli demonstrated less functional play and more off-task behaviour. The off-task behaviour included mouthing objects during 18 different sessions (sessions 5, 9, 13-15, 17-21, 23, 25-27 and 29), burping intentionally for a reaction (sessions 18 and 19) and biting onto objects (sessions 13, 18 and 21). He also appeared fixated, or highly interested, in the wheels on the shuttle. He would often bite them or fold them in and out of the shuttle (sessions 17, 18, 21 and 29).

6.3 Interobserver Agreement

As already discussed in chapter 5, all videotapes (baseline, intervention and probes) were transcribed and scored by this researcher based on the operational definitions of the dependent measures (see §4.11.1.1) and functional play skills for the control group (see §6.2.3). In addition, the research assistant (RA) independently scored the transcripts for 30% of all sessions across phases. The RA was blind to the experimental conditions. The RA was trained by the researcher (for 5 hours) to use the operational definitions to score the dependent measures. For training purposes, the researcher and the RA both scored two randomly selected transcripts from each play set.

The interobserver agreement achieved during training was as follows: scripted actions 75%; scripted verbalizations 75%, unscripted actions 95%; unscripted verbalizations 78%; and control group 85%. The interobserver agreement achieved for the pirates play set was as follows: scripted actions 63%; scripted verbalizations 67%; unscripted actions 87%; and unscripted verbalizations 63%. For the knights and castle play set, interobserver agreement was 82% scripted actions; 71% scripted verbalizations; 89% unscripted actions; and 64% unscripted verbalizations. The interobserver agreement for the control group was 85%.

6.4 Visual inspection of the data

As was discussed in the results chapter for school #1 (§5.5), in single-subject designs, visual inspection is the most common method of evaluating the data (Engel and Schutt,

2014). Through visual inspection any levels, patterns, trends and variability within the data can be identified. This can be for a given participant, within participants, or within groups of participants.

In this section, I will present the results in a multiple-baseline fashion for both scripted play behaviours and unscripted play behaviours. By doing so, the same figures that have been analysed in isolation within subjects and play sets can now be visually analysed to compare the effects of the video modelling versus point-of-view video modelling interventions. Following the presentation of the graphs, I will discuss briefly any patterns, trends and variability that was identified for each participant. Finally, a short summary will be provided in which any trends or patterns identified by participants and by the group will be identified.

6.4.1 ***Participant 1 – Zac***

6.4.1.1 *Zac's Scripted Play Behaviour*

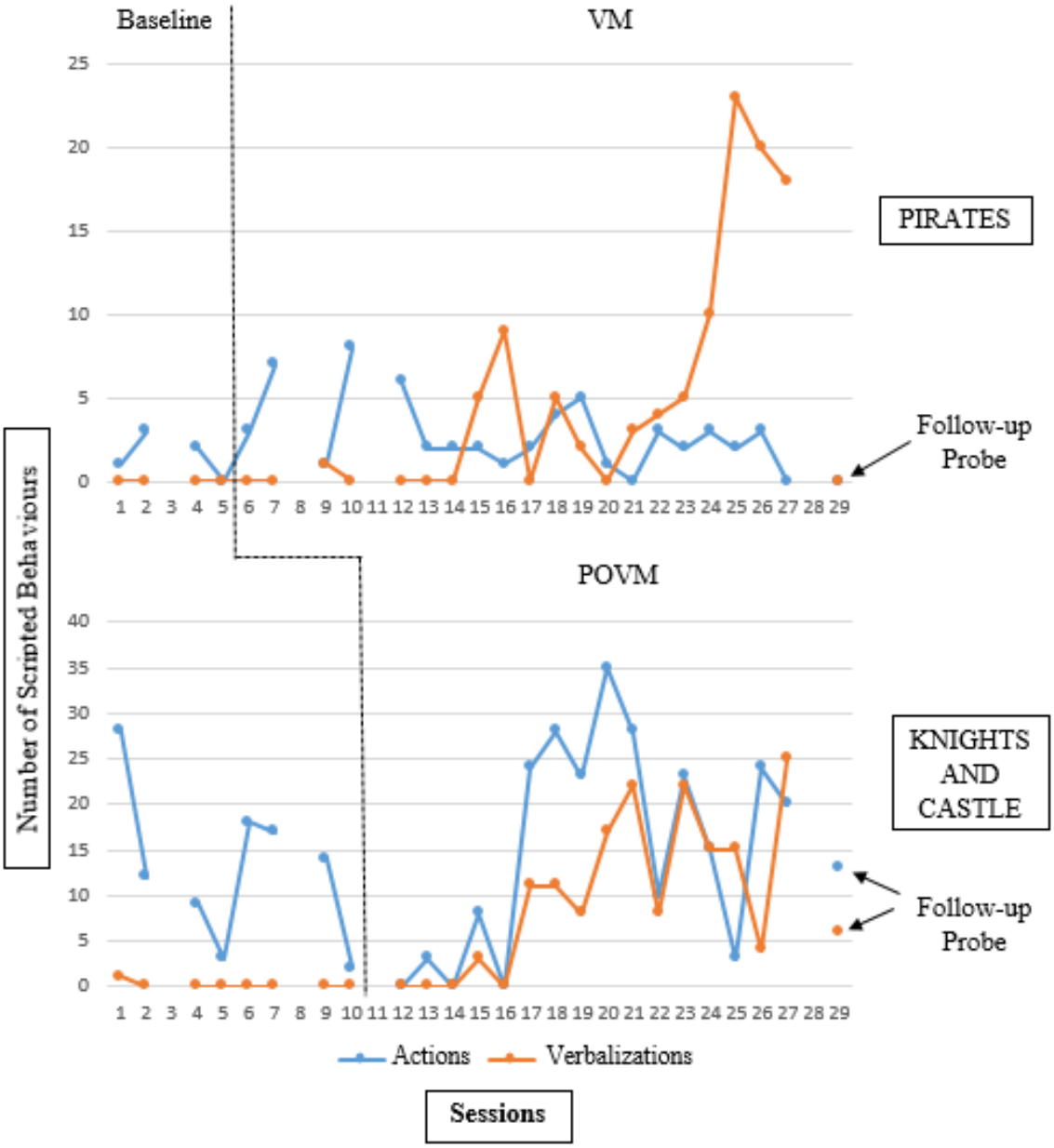


Figure 48. Zac's Scripted Play Behaviours

While visually comparing the two interventions with Zac, there is a noticeable difference in the degree of upward trend following the point-of-view intervention versus the video modelling intervention. Following the point-of-view video modelling intervention used with the knights and castle play set, there is an increasing trend with both of Zac's scripted actions (from 0 to 20) and scripted verbalizations (from 0 to 25). Following the video modelling intervention with the pirates play set, his scripted verbalizations

increased at a slightly lower level (from 0 to 19). However, the level of his scripted actions following the video modelling intervention decreased (from 3 to 0).

6.4.1.2 Zac's Unscripted Play Behaviours

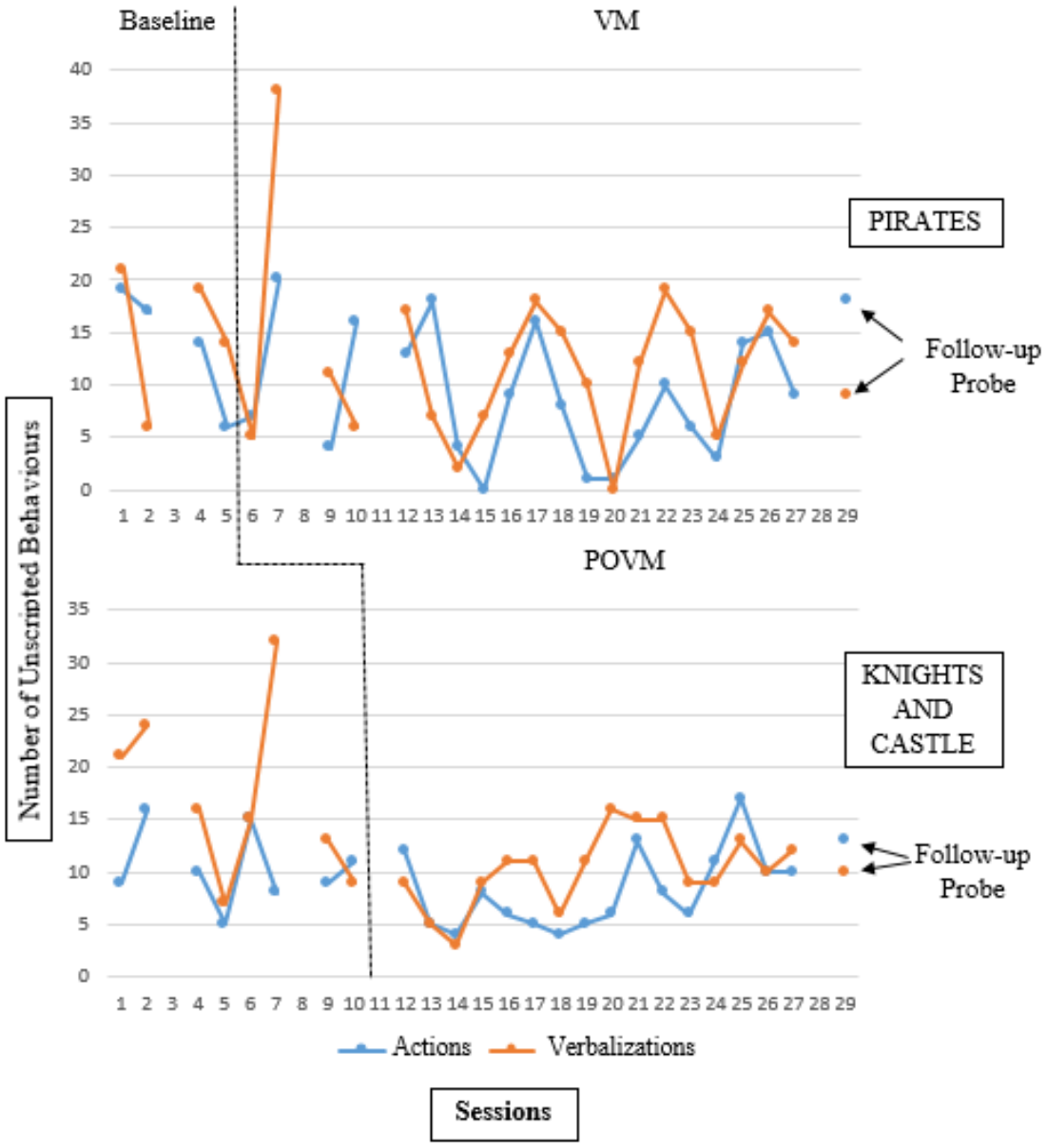


Figure 49. Zac's Unscripted Play Behaviours

Zac's unscripted behaviours following the video modelling intervention with the pirates play set is much more variable than his scripted behaviours (range 7 to 9 for his actions and 5 to 13 for is verbalizations). His unscripted actions reduced slightly following the point-of-view video modelling intervention with the knights and castle play set (from 12 to 10). His unscripted verbalizations increased slightly from 9 to 12).

6.4.2 ***Participant 2 - Eli***

6.4.2.1 Eli's Scripted Play Behaviours

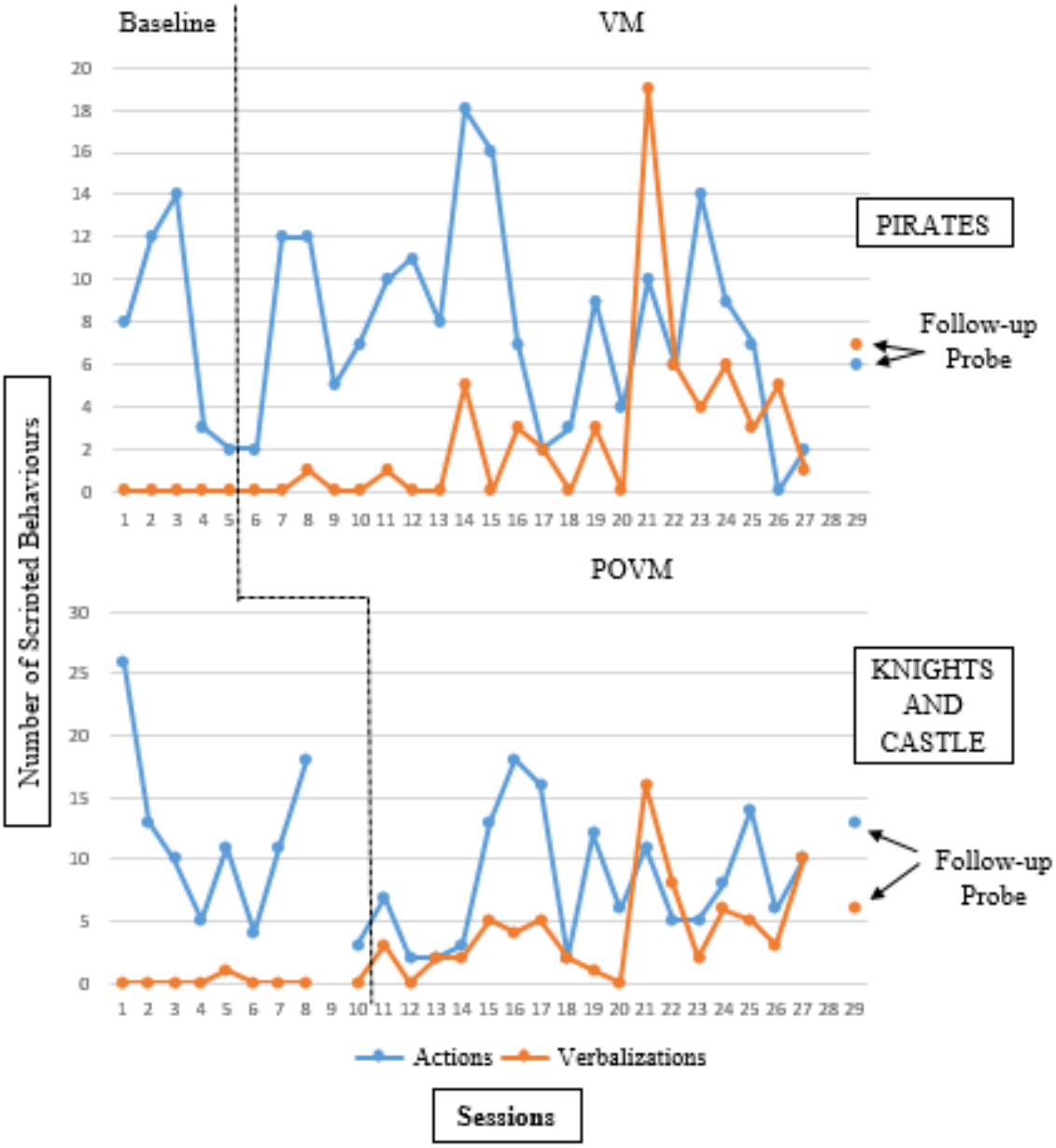


Figure 50. Eli's Scripted Play Behaviours

Through visual analysis of Eli's scripted actions following both interventions, he demonstrated an upward trend, in both his scripted actions and verbalizations following the point-of-view video modelling intervention. Although variability can be seen within his data points, using the method suggested by Nugent (2001), an upward trend can be seen when drawing a line from the lowest data point in the intervention to the last data point. His scripted actions increased from a range of 7 to 10, while his scripted verbalizations increased from a range of 3 to 10.

In contrast, following the video modelling intervention with the pirates play set, two patterns of increasing data sets can be seen. Although there were increases in his actions during these phases, the trend could be considered flat as his first and final data point in the intervention phase remained the same. His scripted verbalizations did show a high peak at session 21 with 19 scripted verbalizations, however quickly dropped down to end the intervention with only one scripted verbalization. This is only a minimal increase following baseline.

6.4.2.2 Eli's Unscripted Play Behaviours

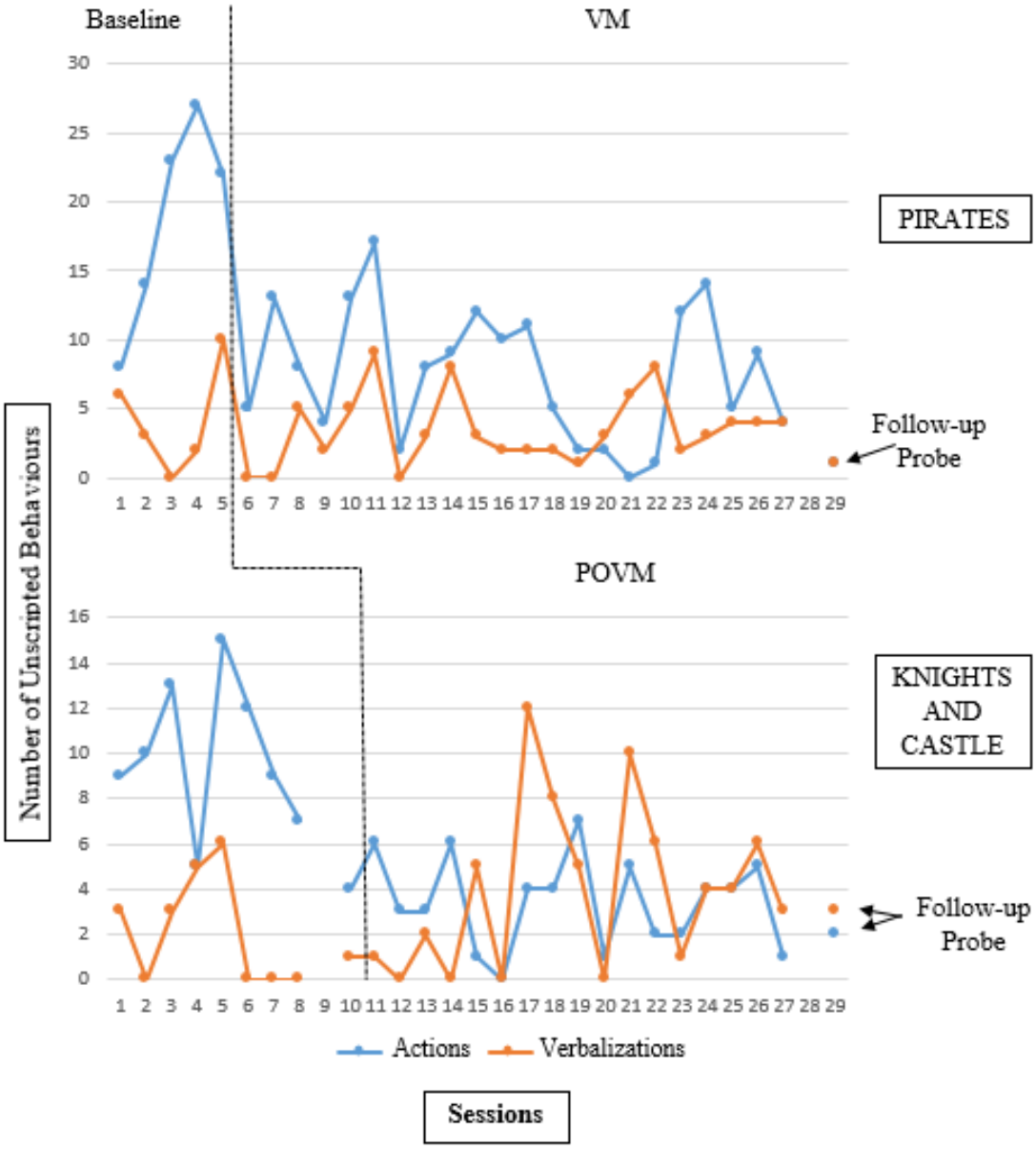


Figure 51. Eli's Unscripted Play Behaviours

Eli's unscripted actions remained the same from the first date point to the final data point in the intervention phase (N=5). His unscripted verbalizations increased during the intervention phase (from 0 to 4). Following the point-of-view video modelling intervention with the knights and castle play set, his unscripted actions decreased (from 6 to 1). His unscripted verbalizations slightly increased (from 1 to 3). Though the visual analysis process, a stable pattern or trend cannot be identified due to the variability of the data points.

In summary, through visual analysis of the results from school 2, both participants showed a higher level of increased responses with their scripted actions and verbalizations following the point-of-view video modelling intervention. Despite some variability in the trajectory of the data points, there is a noticeable increase within this group following the point-of-view video modelling intervention as compared to the video modelling intervention.

6.5 ***Results from the Social Skills Checklist***

As discussed in chapters 3 and 4 (§3.6.1.1 and §4.3.1.1), a *Social Skills Checklis*t was completed by the parents and teachers of the participants with autism at the beginning and at the end of the study for three reasons. First, it addressed one of the gaps identified in the systematic literature review for this study. Second, it provided this researcher with a better understanding of the participants' broad range of social skills. Third, it was thought that the social skills checklist might provide some information about changes in the participants' social skills over the course of the study which may or may not be directly linked to this study.

As mentioned in chapter 5 (§5.5.5), the results from the social skills checklists are extremely variable. This posed the difficulty of not having a true one-to-one comparison. Second, due to the extreme variability of the responses, a direct correlation in changes to participants' social skills over the course of the intervention could not be made, whether positive or negative. A table providing a comparison of the responses to the *Social Skills Checklist* pre- and post-intervention in provided in the appendix (see Appendix KK).

6.6 ***Results from the Feedback Received***

6.6.1 ***Participants' Feedback***

The participants involved in this study (N=2) completed a questionnaire at the conclusion of the study. They were provided with three questions in which they responded with a *'like'* or *'dislike'* response. Table 63 lists their responses. For the participants in school #2, each question was read aloud to the participants individually. The participants then marked their own responses on their questionnaire.

Table 63. Participant Questionnaire Responses

Question	like	dislike
1. What do you think about the video?	√ √	
2. What do you think about playing with friends?	√ √	
3. What do you think about playing with the toys?	√ √	

6.6.2 ***Parents' Feedback***

The parents of the participants involved in this study (N=2*) completed a questionnaire at the conclusion of the study. They were provided with five statements in which they responded with the following response*: strongly agree, agree, neutral, disagree,* and *strongly disagree.* Table 64 lists their responses.

Table 64. Parent Questionnaire Responses *

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. My child's imitation skills have improved over the course of this research study.			√		
2. My child's turn taking skills have improved over the course of this research project.		√			
3. My child's imaginative skills have improved over the course of this research project.		√			
4. I would be interested in learning how to use video modelling at	√				

home.					
5. I would be interested in learning how to use video modelling in the community.	√				

** One parent did not complete the Parent Questionnaire.*

6.6.3 ***Teachers' Feedback***

The teacher of the participants involved in this study (N=1) completed a teacher questionnaire at the conclusion of the study. He was provided with five statements in which he responded with the following response: *strongly agree, agree, neutral, disagree,* and *strongly disagree.* Table 65 lists their responses.

Table 65. Teacher Questionnaire Responses

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. My students have improved their imitation skills over the course of this research study.		√			
2. My students have improved their turn taking skills over the course of this research project.		√			
3. My students have improved their imaginative skills over the course of this research project.			√		
4. I would be interested in learning how to use video modelling in my lessons.		√			
5. I would be interested in learning how to use video modelling to support my students while they are out in the community.		√			

6.7 Summary

In this chapter, the descriptive findings of the quantitative and qualitative data from the second school experiment was presented. First, the data was presented for each participant, specific to each play set. When looking at the data, participants in this group imitated behaviours from the video modelling and the point-of-view video modelling interventions. Specifically, both participants increased the range of their scripted actions and verbalizations following the video modelling intervention (third-person perspective). In contrast only one increased the range of his scripted actions following the point-of-

view video modelling intervention (first-person perspective), while both of the participants increased the range of their scripted verbalizations following the point-of-view video modelling intervention. Second, the data was presented in a multiple-baseline format to allow comparison of the video modelling intervention to the point-of-view video modelling intervention. Specifically, by presenting the figures in this manner, any levels, patterns, trends or variability could be identified. Using the method suggested by Nugent (2001) by drawing a line from the lowest data point in the intervention to the last data point, an upward trend of scripted behaviours, following the point-of-view video modelling intervention was identified for both participants in this group. This upward trend was to a higher degree than the trend identified following the video modelling intervention for both participants. The variability identified within the results will be discussed further in chapter seven in §7.4. Third, the results of the feedback received from the stakeholders in this study— the participants, their parents and their teachers were presented. The next chapter will discuss the implications of the results of this study. This will include a review of the results in relation to existing research, how this study addressed the gap in the literature, limitations to the study, practical applications of the study, generalizability of the study, recommendations in relation to special education practice, policy and theory, and finally recommendations for future research.

Chapter 7. Discussion

7.1 Introduction

The present study investigated whether video modelling or point-of-view video modelling would be more effective in increasing the verbal and action imitation skills of the participants with autism. In order to investigate these two intervention tools, we discussed at length the research problem—the social skills of children with autism. We then looked at the historical background of autism, including its diagnostic criteria, prevalence and core features. With that in mind, we discussed at length the social skills deficit for individuals with autism that span a lifetime. Having laid the foundation for understanding the research problem, we turned our attention to a systematic literature review on video modelling from the first-person perspective and point-of-view video modelling from the third-person perspective. In doing so, the current gap in the literature was identified. This led to a discussion on the theoretical underpinnings of this study—social constructivism, behaviourism, cognitivism, interpretivism and positivism. We then explored the methodology of this study which involved a mixed-methods approach at two primary schools in North East England. Finally, we unpacked and analysed the results.

With this accomplished, I would now like to discuss the implications of the results of this study. This will include a review of the results in relation to existing research; how this study addressed the gap in the literature; limitations to the study; practical applications of the study; generalizability of the study; recommendations in relation to special education practice, policy and theory; and finally recommendations for future research.

7.2 **Review of the results in relation to existing research**

In looking at the results presented in chapters 5 and 6, this study suggests that point-of-view video modelling (first-person perspective) was more effective than video modelling (third-person perspective) in increasing the verbal and action imitation skills of the participants with autism. Specifically, all three groups of participants increased their verbal and action imitation skills following both intervention models. However, point-of-view video modelling elicited the higher level of imitation from the three groups than with video modelling. For example, the change in mean level of scripted actions and scripted verbalizations from baseline to the intervention phase nearly doubled for four out of the seven participants (Esther, Liam, Zac and Eli) following the point-of-view video modelling intervention. This was at a higher level of increase than what was observed

following the video modelling intervention. It is important to point out that findings need to be interpreted with caution in light of several factors, such as the variability within the data points for each of the participants. This and other factors need to be taken into consideration when evaluating the results of this study. More will be discussed in §7.4 regarding the limitations to this study. Having said that, these findings directly answer the first research question, *Will video modelling or point-of-view video modelling be more effective in increasing the verbal and action imitation skills of the participants with autism?* That is, point-of-view video modelling.

Moreover, the two participants from the second school were both able to maintain scripted actions and verbalizations at the follow-up session, following the point-of-view video modelling procedure. For example, during the follow-up probe for the knights and castle play set, Zac demonstrated 13 scripted actions, which is just below the average mean for the intervention phase and six scripted verbalizations, which is less than the average mean during the intervention phase. Although both of Zac's scripted actions and verbalizations were lower than the average mean, the skills could be considered as maintained following the intervention. Eli, on the other hand, demonstrated 13 scripted actions and 6 scripted verbalizations during the follow-up probe, which are both higher than the average mean throughout the intervention phases. These results are significant because these participants were able to maintain skills three weeks following the last intervention session. These additional findings answer the second research question, *Will video modelling or point-of-view video modelling result in maintenance of skills at a three-week follow-up?* That is, point-of-view video modelling.

In light of the results from this study, the findings are consistent with the results of Hine and Wolery (2006) and Tetreault and Lerman's (2010) studies in that both participants increased their play skills following the POVM procedure. In addition, the findings are consistent with the results of Sancho et al.'s (2010) study in that both participants maintained their skills following the POVM procedure. Furthermore, this study adds to the current body of knowledge of POVM procedures, since a very small number of studies have been conducted to date in this area.

Another area that this study contributed to the body of knowledge of POVM procedures is the inclusion of input from the participants, their parents and their teachers—the stakeholders. For example, the participants responded favourably to all questions

presented to them. Six out of seven participants responded that they *liked* the video, while all participants responded that they *liked* playing with the friends as well as with the toys. (See §5.7.1 and §6.6.1 for a description of how the participant questionnaires were administered.) In looking at the feedback from the parents, I would like to specifically look at three of the five questions they were presented. When asked if their child's imitation skills improved over the course of the study, three parents *agreed* and three remained *neutral*. In regards to the statement that they would like information on how to use video modelling in the home and in the community, three parents *strongly agreed* and three *agreed* to this statement. Similarly, when asked if their student's imitation skills improved over the course of the study, all three teachers *agreed*. When asked if they would like further information on how to use video modelling in their lessons, one teacher *agreed*, one remained *neutral* and one *disagreed*. The same feedback was received when asked if they would like further information on how to use video modelling to support their students while they are out in the community. Overall, the feedback received from the stakeholders were positive. I believe it speaks to the social validity of this study. With that said, as with any type of questionnaire, the responses are subjective, that is, they reflect the personal experiences and understanding of each individual.

7.3 **Addressing the gap in literature**

This study has addressed the five current gaps identified in the literature (see §2.4.1.3.9). First, to my knowledge, this is the first study to provide a comparison of video modelling to point-of-view video modelling on the social skills of children with autism. As we looked at in chapter 2 (§2.4.3.9) with the comprehensive systematic literature review, there are only a limited number of studies that have compared intervention packages. These include a comparison of video modelling to live modelling (Charlop-Christy, Le, and Freeman, 2000); Gena, Couloura, and Kymissis, 2005) and video modelling to video self-modelling (Sherer et al., 2001). However, no studies have compared video modelling to point-of-view video modelling. This is an area that to date, has not yet been explored.

The outcome of this study has many implications for educators and professionals working with individuals with autism. Keeping in mind that individuals with autism can focus on certain details while missing out on relevant details, as well as the challenges they face with perspective-taking, clinicians and educators alike may want to explore further the presentation of material in the first-person perspective. It is often natural for educators in

a social classroom setting to ask their students to watch someone perform a behaviour from the third-person perspective, whether live or in a video. With the understanding that some individuals with autism may imitate better when shown something presented to them from the first-person perspective, educators may want to change how information is presented. This can have other implications regarding how hand motions such as sign language are used in the classroom, or how gestures are used to support sound development or other academic tasks presented. The same can be said for professionals working in a clinical setting. If a client is shown something from the third-person perspective, whether live or in a video, it would also be beneficial to present information from the first-person perspective to see if better results could be gained. Removing extraneous details from the presentation, and focusing on the relevant details (e.g., as in point-of-view videos) educators and clinicians may see a more rapid response and understanding to the presentation.

Second, this study included a social skills checklist to provide this researcher with a better understanding of the participant's broad range of social skills. This addressed the gap of a limited number of studies on social skills interventions in which social skills assessments were administered as part of the study's methodology (see §2.4.1.3.5 and §2.4.1.3.9). As discussed in chapters 5 and 6 (see §5.6 and 6.5), the results of the *Social Skills Checklist* were extremely variable and a direct correlation in changes to participants' social skills over the course of the intervention could not be made, whether positive or negative. Due to the subjective nature of the social skills checklist, it is understandable that some variability would occur. However, despite the variable responses, important information can be gleaned from the checklists. First, it can be used as a tool for curriculum design, instructional planning and establishing targets for interventions. Additionally, it can be used for creating Individualized Education Plan (IEP) goals and objectives. The *Social Skills Checklist* also provided an understanding of the participant's current level of social skills functioning in a broad sense, covering social play and emotional development, emotional regulation, group skills, and communication skills. Second, it can be used to create specific goals and objectives to address the participant's needs. Third, it can provide an understanding of the perspective of the individual completing the checklist (whether the parent or the teacher). Based on the person's perspective, specific targets can be set to address these areas, whether in the community or in the school setting.

Third, this study clearly stated the research questions as: (1) Will video modelling or point-of-view video modelling be more effective in increasing the verbal and action imitation skills of the participants with autism? (2) Will video modelling or point-of-view video modelling result in maintenance of skills at a three-week follow-up?

Fourth, this study included the participation of mainstream peers in all phases of the study—baseline, intervention, and follow-up probes. As we discussed in chapter 2, including typically developing peers help individuals with autism observe the behaviours of peer role models, and imitate those behaviours in a naturalistic setting rather than in an isolated one, in the presence of the peer role models. The use of peers, coupled with video modelling, utilizes two recognized established treatments for individuals with autism—video modelling and peer-mediated interventions (The National Autism Center, 2009). Similarly, as Nikopoulos and Keenan (2006) point out, typically developing peers have been used in effective techniques to enhance the social skills of children with autism. In the same light, several participants in the study by Müller, Schuler and Yates (2008) described "the importance of observing how non-autistic individuals, or 'neurotypicals', interact socially, and trying to learn from this" (p.183).

Fifth, this study included the input from all major stakeholders in the research study—the participants, parents and teachers. This is an important component to be included in research studies, specifically when working with vulnerable individuals.

7.4 **Limitations to the study**

Results of this study should be interpreted with the following limitations in mind. These limitations are the ones in which I did not have any control over.

First, limitations due to the number of participants. During the planning phases of this study, the intention was to have three groups of participants. Each group would have 5-6 participants that were matched for age, language and ability. For each play set, one group would receive the first-person perspective treatment, the second group the third-person perspective and the final group would be a control group, receiving no treatment. With this in mind, the control group would have provided more experimental control and comparisons. If there had been a control group receiving no treatment for the first two play sets at both schools, a better comparison would be provided to see whether the treatment itself promoted higher levels of imitation than other factors such as the play set

or the mainstream peers that were involved in the intervention. However, due to the small number of participants available which met the criteria for this study, the existing groups of participants each received a different treatment for the first and second play set, and no treatment for the final play set. This impacts the discussion of the results of the first-person perspective versus the third-person perspective treatment.

Second, as discussed in chapter 3 (§3.5.2.3), there were limitations in obtaining consent from the participants in the study. In real life research, one cannot control who opts in and who opts out of the study. This applies to the school level as well as the participant level. Fortunately, both schools involved in the study voluntarily provided their consent. Additionally, parental consent was obtained for a majority of the children that met the inclusion criteria for the study. Yet, some difficulties had arisen in locating primary schools which enrolled both mainstream children and children with special educational needs that met the inclusion criteria for this study (see §3.5.2.1.1 and §3.5.2.2). Only a small number of participants fell within the age range of this study at each school.

Third, some scheduling issues arose due to the amount of time children were being pulled from their classroom activities and curriculum instruction in order to participate in this study. At the first school site, the amount of time involved in conducting three sessions daily for each group impacted the amount of time when the mainstream children were away from their instructional programme. Consequently the Headteacher made a decision to reduce the amount of time the mainstream children were made available for the study. Because of this, I had to make a decision on how to reduce the total time of the sessions. To avoid compromising the integrity of the study, I decided to keep the first two sessions—video modelling and point-of-view video modelling intact. However, I had to drop the third session—the control group. Because of this, the control group ended on the twelfth day of intervention rather than continuing through to the end of the study. Although this change took place, I was able to gather some information from the control group for the first school site despite the shorter number of sessions. In contrast, the second school had all three sessions each day for the entirety of the intervention.

Fourth, on a few occasions, no sessions took place due to scheduling issues at the first school site. For example, sessions were not held on six different days that were originally scheduled—three days due to the participants being away on educational visits and three days due to an Ofsted school inspection. Due to this, the regularity of the intervention at

the first school site, i.e. 5 days per week, was effected—one week having four days of sessions, one week only two days and one only one day of sessions. Additionally, at the first school site, the children had several term breaks. The intervention involved three weeks of intervention, followed by a one week break, then five weeks of intervention followed by a two and one half weeks break. Every effort was made to schedule the intervention with the minimal amount of breaks. Originally the intervention was to take place from 29th January through 27th of March 2013 to avoid the longer Spring half-term break. However, due to school scheduling preferences, the six days which were originally missed were added one week after the children returned from the Spring half-term break. This extended the conclusion of the intervention to three and one half weeks after it was originally scheduled to end. This additional unplanned lengthy break may have had an impact on the data. In contrast, the intervention that took place at the second school site only had a one one-week term break.

Fifth, a criterion performance for each participant to achieve prior to transferring from one condition to the next was included in the planning phases of this research study. The criterion performance expected was 80% of the scripted actions and verbalizations. On the day of the twelfth session at the first school site, as was discussed in the second point above, the amount of time the students needed to participate in the study became an issue for the school site. At that point, the students had not yet achieved the criterion performance or even half of the expected performance. The administration limited the amount of time the students were made available in the study. This and the fact that the study was expected to conclude at that school by the end of the following month, a decision was made to introduce the next condition. This was not ideal by any means. At that stage, no significant changes had yet been observed with Group #1. However, two of the three participants in Group #2, Esher and Liam, had already demonstrated 12 and 8 scripted actions respectively. It was anticipated that the upward trend that was observed thus far would continue throughout the intervention phase, despite being introduced to the next condition for the second play set. As other conditions such as prompting levels was not established in the planning of this study, it was not introduced to see if the criterion performance could be reached more readily. With the time constraints raised at the first school site in mind, the intervention conditions at the second school were introduced in a similar manner. Although the two participants at School #2 had not achieved the desired criterion performance, the second treatment condition was introduced. Had the criterion performance been established at both school sites, it is anticipated that the results would

have shown less variability and more stable trends than identified in this study. The issues raised with time constraints, speaks to the types of challenges researchers face in conducting research in a real life setting. Should a research be conducted in a controlled clinical setting, issues such as time limitations could easily be alleviated. However, the issue of time constraints, criterion performance and whether to include additional conditions to the independent variable all need to be addressed in future research.

Sixth, whether the possibility of order effects of the two interventions, within subjects, was actually controlled. As discussed in §3.16.3 and §4.13.3, order effects is a change in the participants' behaviour due to the order in which the treatment conditions are presented. Order effects can be attributed to practice and even fatigue (McLeod, 2007; Cozby, 2009). For example, participants may know what to do in a second condition, if they learn this already in the first condition. This is known as practice effect. With fatigue effect, participants may become tired of the condition and perform worse than they did in the first condition. In order to reduce the possibility of order effects within groups in this study, counterbalancing of order treatments was implemented (McLeod, 2007). By this, I mean that each group of participants were presented with a different order of treatment conditions. For example, one group viewed the video filmed from the third-person perspective, while the second group viewed the video filmed from the first-person perspective for the same play set. The results of this study suggest that the two groups which displayed a higher level of imitation following the POVM treatment, received the treatment in a different order from each other. For example, group two at the first school was presented with the POVM treatment with the first play set and the VM treatment with the second play set. The group performed at a higher rate with the first treatment. But the group at the second school was presented with the VM treatment for their first play set and the POVM treatment for the second play set. In this case, the second group performed at a higher rate with the second treatment. It seems that for the first group, it is unlikely that fatigue or practice order effects occurred since their imitation responses were better following the first treatment package. On the other hand, since the second group responded at a higher rate with the second treatment package, there is a possibility of practice effect. Yet it is still difficult to say conclusively how much the participants' interest in a particular play set had a factor in the results. Therefore, a degree of caution must be taken in considering the results. This is due to the possibility that the results would have been much different had each group only been exposed to one treatment condition.

Seventh, limitations involving the control group. As mentioned earlier, during the planning phases of this study, the intention was to have three groups of participants. For each play set, one group would receive the first-person perspective treatment, the second group the third-person perspective and the final group would be a control group, receiving no treatment. With this in mind, the control group would have provided more experimental control and comparisons. If there had been a control group receiving no treatment for the first two play sets at both schools, a better comparison would be provided to see whether the treatment itself promoted higher levels of imitation than other factors such as the play set or the mainstream peers that were involved in the intervention. However, due to the small number of participants available which met the criteria for this study, the existing groups of participants each received a different treatment for the first and second play set, and no treatment for the final play set. This impacts the discussion of the results of the first-person perspective versus the third-person perspective treatment. However, despite the fact that each group of participants received both treatment packages as well as participated in a control group phase, some beneficial data was obtained in relation to their social skills. The information gleaned from the analysis of the functional play skills that the groups demonstrated during the control group phase can be a focus for future instruction and intervention on social skills.

Eighth, the addition of *the Social Skills Checklist,* did not provide the hypothesized results to help the investigator in developing this study nor in interpreting the results of this study. As discussed in the results of *the Social Skills Checklist* in §5.6 and 6.5, the checklist did meet the needs of addressing the gap identified in the systematic literature review and it did provide the investigator a better understanding of the participants' broad range of social skills. However, it did not provide stable results which could speak to any possible periphery social skills which may have been impacted during the course of this study. Although there are limitations in relation to the use of this checklist, in future research, I believe that this tool could be used to identify social skills that need further intervention. This tool could then be used to help develop an intervention plan. With this in mind, the tool could be administered by someone trained in the intervention to complete pre- and post-intervention. This would hopefully streamline the results and avoid the issue of great variability as was seen from the responses of the parents and the teachers involved in this study.

7.5 **Practical applications of the study**

As this study focused on the social skill of imitation, it was important to address both the learning function of imitation as well as the social function of imitation. This study provided a platform where children with autism could be taught the skill of imitation by viewing the video, followed by an opportunity to practice the skill(s) among mainstream peers. This addressed both the learning function and the social function of imitation (Uzgiris, 1981). This intervention was implemented in a natural setting among mainstream peers, where other social communicative behaviours occur (Ingersoll, 2008). It did not occur in isolation or in a clinical setting. Yes one can learn in isolation, but in order to generalize, you need exposure to naturalistic social settings. In the literature, it is highly recognized that individuals with autism have great difficulty connecting what they have learned in one situation in relation to another. Additionally, this study incorporated mainstream peers into all phases of the intervention. For example, Bellini (2006) emphasized the importance of rich social opportunities and experiences that the natural environment provides, rather than a clinical setting or a specific social skills instruction that ends the moment the child leaves the therapy room (p.198). Elliot and Gresham (1991), as cited by Bellini (2006) stress that the "lack of opportunity to interact socially and lack of opportunity to practice social skills are two factors that contribute to the development of social skills deficits" (p. 198). Similarly, Bellini (2006) stated, "in any formal social skills training, children need opportunities to practice their newly learned skills with other children in natural settings" (p. 198).

Another practical application of this study is that it reinforces the comments from adults with autism in Müller, Schuler and Yates's (2008) study when they spoke about their own social experiences. Several participants commented on observing the social behaviours of non-autistic individuals in order to learn from them. One participant in their study talked about copying other people. It is through this type of exposure to social situations where one practices, watches, interprets, and begins to understand social norms and rules that one can learn and acquire new social skills. Without these experiences, children with autism will be at a disadvantage.

For a moment, I would like to revisit the example I used at the beginning of chapter one. Imagine *yourself* being a child who is overwhelmed when he enters a classroom. Further, you approach some children playing a game that you have never seen before. You want very much to play, but you are confused by the intricacies. The children appear to be well

adept at playing this game but you are lost. What can be done? Imagine further that your teacher notices your interest in the game. She provides you an opportunity to watch a video that she has made of the children playing the game. Further, in the video, the intricate steps of the game are broken down for you. After watching the video, you have a chance to imitate the actions you observed. The next time you enter the classroom and see the same peers playing the game, you feel more confident in playing now that you have had an opportunity to practice what you have learned through the video. This example illustrates how easily video modelling can be incorporated into the supports available in a classroom for children with autism. Further, the same strategies are applicable to all children. This example also confirms Bandura's (1977) statement,

> *"Learning would be exceedingly laborious, not to mention hazardous, if people had to rely solely on the effects of their own actions to inform them what to do. Fortunately, most human behaviour is learned observationally through modelling: from observing others one forms an idea of how new behaviours are performed, and on later occasions this coded information serves as a guide for action." (p.22)*

7.6 **Generalizability of the study**

Although the study was conducted in two primary schools in the North East of England with a small number of participants, the results could be generalizable to other areas. It would be interesting to see the same study replicated with a larger sample of participants, possibly in a larger metropolitan city where higher numbers of children with autism are enrolled in schools. Additionally, if a larger number of participants were involved in the study, other variations of the intervention could be put in place. I will discuss this further in §7.8 below.

As discussed above, one of the limitations of this study was obtaining a larger number of participants. As a result, this study may be considered more of a feasibility study due to the low number of participants. However, I believe that the comprehensive nature of the study, involving mixed-methods and quite a broad range of data, lends itself to be a robust study. Furthermore, when a study can be replicated it supports its validity. This study has demonstrated generalizability in that the second experiment replicated the results of the first experiment, to a higher degree.

7.7 **Recommendations in relation to special education policy, practice and theory**

7.7.1 ***Recommendations for policy***

In the United Kingdom, where this study took place, the Special Educational Needs (SEN) Code of Practice (2001), which incorporates the provisions of the Special Educational Needs and Disability Act 2001, is a statutory code for those involved in the education sector. It lays out the special education policy provisions to address the following four areas of need: (1) Communication and interaction; (2) Cognition and learning; (3) Social, mental and emotional health; and (4) Sensory and/or physical (UK Department of education and skills, 2001, p. 61). Specifically, in the area of social needs, section 7:60 in the SEN Code of Practice states that children and young people who demonstrate immature social skills may require support in "developing social competence and emotional maturity, help in adjusting to school expectations and routines, and help in acquiring the skills of positive interaction with peers and adults" (UK Department of education and skills, 2001, p. 87).

The Code of Practice (2001) further states in the following section 7:61 that the local education agency will need to consider how these interventions can be provided, whether through school-based supports or a statutory assessment to determined specialized need for supports. A new Code of Practice is expected to be in place from 1 September 2014. The draft of the SEN Code of Practice (2014) has changed the 'behaviour, social and emotional' category to 'social, mental and emotional health' (Nasen, n.d.). The drafted revised code addresses the need for special educational provision for children who have social difficulties that cause them to be socially withdrawn or isolated, among other things (UK Department of Education, 2013). In Nasen's (n.d.) guide to the drafted 2014 SEN Code of Practice they point out that once a special educational need is identified, "early years providers, schools and colleges should put appropriate evidence-based interventions in place." Video modelling interventions, such as the one used in this study, addresses the need for evidence-based interventions to be used to support children with special educational needs, as indicated in the SEN Code of Practice. Therefore, it is recommended that video modelling interventions be approved by local education agencies to be used in any educational setting which educates children with autism.

7.7.2 ***Recommendations for practice***

Professionally as a teacher myself, I see many educators currently teaching under the umbrella of 'standards-based instructional rigor and expectations' focus primarily on the academic skill acquisition of students with autism and their unusual or rigid behaviours, however, often at the expense of neglecting the need for an individualized, peer interactive, socially driven curriculum program to address the social impairments of their students. There is currently a mismatch between effective educational programming and effective interventions for students with autism. By this I mean that there exists effective educational and intervention strategies for students with autism, however, they are often provided as separate components by educators rather than in an integrated approach which addresses the academic, behavioural, communication and social deficits of students with autism. Educators often face time constraints, curriculum mandates, as well as financial constraints which limit their ability to implement such an integrated approach for their students with autism. There is a current need for cost-effective, time efficient and non-intrusive intervention programs which can be imbedded into an existing classroom curriculum. Video based instruction, in the form of video modelling and point-of-view video modelling, is a solution to the existing need. Therefore, it is recommended that video modelling, either VM or POVM, not only be supported by local education agencies, but that professional development in this area be provided to mainstream and special education teachers. With the current availability to the technology needed to conduct video modelling interventions, e.g. a digital camera and a model, this should be easily implemented as a support for children with autism in any educational setting.

7.7.3 ***Recommendations for theory***

Through this study, *a conceptual framework for supporting children with autism with their social skills development* has emerged. It is through the implementation of a video modelling intervention which is rooted in the *social learning theory*, that children with autism can enhance their social skills and potentially experience an increased level of peer acceptance. This can be attributed to an intervention—video modelling—which taps into the relative strengths of individuals with autism, filters out excess stimuli and narrows one's focus to the relevant details that they observe. Additionally, this intervention provided children with autism access to typically developing peers in naturally occurring social settings. It is believed that this video modelling intervention has provided the children with autism enhanced social skills and an increase in acceptance by their peers. As a result, it is also believed that the children with autism are less at risk for

social anxiety, loneliness and social isolation. This intervention lends itself to a cost effective, time efficient intervention which can be implemented in any classroom, home or community setting. The following figure (Figure 52) illustrates the conceptual framework of this study.

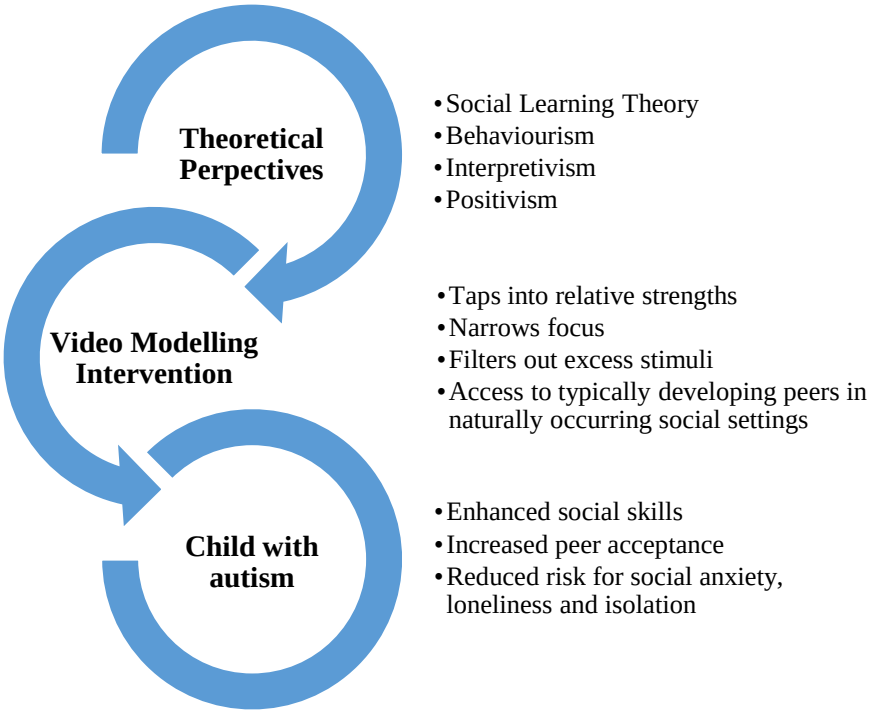


Figure 52. A *conceptual framework for supporting children with autism with their social skills development*

7.8 **Recommendations for future research**

As we discussed in §2.3.2.1, video instruction has become recognized in the literature as a form of intervention since the 1970s (Shukla-Mehta, Miller and Callahan, 2010). For example, video instruction has been used to teach a variety of social, academic, behaviour and functional skills to students with autism spectrum disorders (Rayner, Denholm, and Sigafoos, 2009). Having said this, there are several areas that I would recommend further research in the area of video modelling to solidify its effectiveness. Specifically, I believe it would be beneficial to replicate this study with different groups of children with autism based on age, cognitive and language levels. By doing so, we could gain a better understanding of how children with autism of different ages and abilities respond to video modelling interventions. Second, further research is needed in the area of video modelling which provides scaffolding (e.g. breaking down a task into manageable units for a child who may have difficulty imitating). This same procedure could be applied to the different age and ability groups to gain a better understanding of which subgroup benefits the most from this type of scaffolding. Third, individuals with autism typically respond better to

visual information that is coupled with auditory information. It would be beneficial to create video modelling procedures in which subtitles were provided throughout the video. The video could be presented initially with the subtitles and then eventually phased out. This can add to the body of literature on the visual strengths of individuals with autism. Fourth, with the current recognition that the voices of individuals with disabilities are not often included in research, it would be beneficial for participants to be part of the selection process of what is included in the intervention. What I mean by this is for example, children with autism could be asked what set of toys or game they would like to learn how to play. This information could be used to develop the video modelling procedure specifically for those children. Further, it would be interesting to allow children with higher functioning autism to help develop the videos to be used in the procedure. Finally, future research using a larger number of participants with statistical analyses would greatly contribute to the current body of literature on video modelling.

7.9 **Conclusion**

This study contributes to a growing body of literature on the effectiveness of video interventions on the social skills of children with autism in three main areas. The first contribution of this study is that it has addressed the five gaps identified in the literature: providing a comparison of video modelling to point-of-view video modelling on the social skills of children with autism; including and administering a social skills assessment as part of the study's methodology; clearly stating the research questions; including the participation of mainstream peers in all phases of the study; and including the input from all major stakeholders in the research study—the participants, parents and teachers. The second contribution is by simply adding research on POVM to the currently scarce body of literature in this area. The final unique contribution of this study is the development of a conceptual framework for supporting children with autism with their social skills development. It is through the implementation of a social, behavioural, cognitive, interpretive, positive-based intervention of video modelling that children with autism have enhanced their social skills and have an increased level of peer acceptance.

APPENDICES

Appendix A

DSM-5 Diagnostic Criteria for Autism Spectrum Disorder

The American Psychiatric Association's Diagnostic and Statistical Manual, Fifth Edition (DSM-5) provides standardized criteria to help diagnose ASD.

Diagnostic Criteria for 299.00 Autism Spectrum Disorder

A. Persistent deficits in social communication and social interaction across multiple contexts, as manifested by the following, currently or by history (examples are illustrative, not exhaustive; see text):
   1. Deficits in social-emotional reciprocity, ranging, for example, from abnormal social approach and failure of normal back-and-forth conversation; to reduced sharing of interests, emotions, or affect; to failure to initiate or respond to social interactions.
   2. Deficits in nonverbal communicative behaviors used for social interaction, ranging, for example, from poorly integrated verbal and nonverbal communication; to abnormalities in eye contact and body language or deficits in understanding and use of gestures; to a total lack of facial expressions and nonverbal communication.
   3. Deficits in developing, maintaining, and understand relationships, ranging, for example, from difficulties adjusting behavior to suit various social contexts; to difficulties in sharing imaginative play or in making friends; to absence of interest in peers.

   Specify current severity:
   Severity is based on social communication impairments and restricted, repetitive patterns of behavior.

B. Restricted, repetitive patterns of behavior, interests, or activities, as manifested by at least two of the following, currently or by history (examples are illustrative, not exhaustive; see text):
   1. Stereotyped or repetitive motor movements, use of objects, or speech (e.g., simple motor stereotypes, lining up toys or flipping objects, echolalia, idiosyncratic phrases).
   2. Insistence on sameness, inflexible adherence to routines, or ritualized patterns of verbal or nonverbal behavior (e.g., extreme distress at small changes, difficulties with transitions, rigid thinking patterns, greeting rituals, need to take same route or eat same food every day).
   3. Highly restricted, fixated interests that are abnormal in intensity or focus (e.g., strong attachment to or preoccupation with unusual objects, excessively circumscribed or perseverative interests).
   4. Hyper- or hyporeactivity to sensory input or unusual interest in sensory aspects of the environment (e.g. apparent indifference to pain/temperature, adverse response to specific sounds or textures, excessive smelling or touching of objects, visual fascination with lights or movement).

   Specify current severity:
   Severity is based on social communication impairments and restricted, repetitive patterns of behavior.

C. Symptoms must be present in the early developmental period (but may not become fully manifest until social demands exceed limited capacities, or may be masked by learned strategies in later life).
D. Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning.
E. These disturbances are not better explained by intellectual disability (intellectual developmental disorder) or global developmental delay. Intellectual disability and autism spectrum disorder frequently co-occur; to make comorbid diagnoses of autism spectrum disorder and intellectual disability, social communication should be below that expected for general developmental level.

Note: Individuals with a well-established DSM-IV diagnosis of autistic disorder, Asperger's disorder, or pervasive developmental disorder not otherwise specified should be given the diagnosis of autism spectrum disorder. Individuals who have marked deficits in social communication, but whose symptoms do not otherwise meet criteria for autism spectrum disorder, should be evaluated for social (pragmatic) communication disorder.

Specify if:

With or without accompanying intellectual impairment
With or without accompanying language impairment
Associated with a known medical or genetic condition or environmental factor (Coding note: Use additional code to identify the associated medical or genetic condition.)
Associated with another neurodevelopmental, mental, or behavioral disorder (**Coding note**: Use additional code[s] to identify the associated neurodevelopmental, mental, or behavioral disorder[s].
With catatonia (refer to the criteria for catatonia associated with another mental disorder)
(**Coding note**: Use additional code 293.89 catatonia associated with autism spectrum disorder to indicate the presence of the comorbid catatonia.)

References

1. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5th ed. Arlington, VA: American Psychiatric Association; 2013.

Appendix B

ICD-10 Criteria for "Childhood Autism"*

A. Abnormal or impaired development is evident before the age of 3 years in at least one of the following areas:

- receptive or expressive language as used in social communication;
- the development of selective social attachments or of reciprocal social interaction;
- functional or symbolic play.

B. A total of at least six symptoms from (1), (2) and (3) must be present, with at least two from (1) and at least one from each of (2) and (3)

1. Qualitative impairment in social interaction are manifest in at least two of the following areas:
   a. failure adequately to use eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction;
   b. failure to develop (in a manner appropriate to mental age, and despite ample opportunities) peer relationships that involve a mutual sharing of interests, activities and emotions;
   c. lack of socio-emotional reciprocity as shown by an impaired or deviant response to other people's emotions; or lack of modulation of behavior according to social context; or a weak integration of social, emotional, and communicative behaviors;
   d. lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g. a lack of showing, bringing, or pointing out to other people objects of interest to the individual).
2. Qualitative abnormalities in communication as manifest in at least one of the following areas:
   a. delay in or total lack of, development of spoken language that is not accompanied by an attempt to compensate through the use of gestures or mime as an alternative mode of communication (often preceded by a lack of communicative babbling);
   b. relative failure to initiate or sustain conversational interchange (at whatever level of language skill is present), in which there is reciprocal responsiveness to the communications of the other person;
   c. stereotyped and repetitive use of language or idiosyncratic use of words or phrases;
   d. lack of varied spontaneous make-believe play or (when young) social imitative play
3. Restricted, repetitive, and stereotyped patterns of behavior, interests, and activities are manifested in at least one of the following:
   a. An encompassing preoccupation with one or more stereotyped and restricted patterns of interest that are abnormal in content or focus; or one or more interests that are abnormal in their intensity and circumscribed nature though not in their content or focus;
   b. Apparently compulsive adherence to specific, nonfunctional routines or rituals;

c. Stereotyped and repetitive motor mannerisms that involve either hand or finger flapping or twisting or complex whole body movements;
d. Preoccupations with part-objects of non-functional elements of play materials (such as their odor, the feel of their surface, or the noise or vibration they generate).

C. The clinical picture is not attributable to the other varieties of pervasive developmental disorders; specific development disorder of receptive language (F80.2) with secondary socio-emotional problems, reactive attachment disorder (F94.1) or disinhibited attachment disorder (F94.2); mental retardation (F70-F72) with some associated emotional or behavioral disorders; schizophrenia (F20.-) of unusually early onset; and Rett's Syndrome (F84.12).

*World Health Organization. (1992). *International classification of diseases: Diagnostic criteria for research* (10th edition). Geneva, Switzerland: Author.

Appendix C

Standardized and Informal Assessments for School #1 Participant—David

PEP-R assessments for David

	September 2010 41 months	October 2011 54 months	March 2012 59 months	October 2012 66 months
Developmental Score	23 months	36 months	48 months	48 months
Age	14 months	18 months	21 months	21 months
Quotient	34.1%	33.3%	35.6%	31.8%

SCERTS assessments for David

SCERTS Profile Summary	30 Jan 2012 4 yr, 9 mo	3 May 2012 5 yr, 1 mo	2 July 2012 5 yr, 3 mo
Social Communication			
Joint Attention	29/54 (54%)	34/54 (63%)	37/54 (69%)
Symbol Use	29/62 (47%)	31/62 (50%)	39/62 (63%)
Emotional Regulation			
Mutual Regulation	22/38 58%)	32/38 (84%)	36/38 (95%)
Self-Regulation	21/40 (53%)	23/40 (58%)	30/40 (75%)
Transactional Support			
Interpersonal Support	52/66 (79%)	63/66 (95%)	65/66 (98%)
Learning Support	36/50 (72%)	41/50 (82%)	41/50 82%)
Social-emotional Growth Indicators Profile			
Happiness	7/10 (70%)	9/10 (90%)	9/10 (90%)
Sense of self	8/10 (80%)	8/10 (80%)	9/10 (90%)
Sense of others	6/10 (60%)	9/10 (90%)	9/10 (90%)
Active learning & organization	3/10 (30%)	3/10 (30%)	4/10 (40%)
Flexibility and resilience	4/10 (40%)	6/10 (60%)	9/10 (90%)
Cooperation & appropriateness of behaviour	5/10 (50%)	6/10 (60%)	8/10 (80%)
Independence	7/10 (70%)	7/10 (70%)	9/10 (90%)
Social membership and friendships	7/10 (70%)	7/10 (70%)	7/10 (70%)

Appendix D

Standardized and Informal Assessments for School #1 Participant—John

Unfortunately, no assessment data was made available for this participant.

Appendix E

Standardized and Informal Assessments for School #1 Participant—Esther

PEP-R assessments for Esther

	May 2012 52 months	October 2012 57 months
Developmental Score	50 months	60 months
Age	21 months	23 months
Quotient	43.8%	40.3%

SCERTS assessments for Esther

SCERTS Profile Summary	8 July 2012	12 Dec 2012
Social Communication		
Joint Attention	19/54 (35%)	21.62 (34%)
Symbol Use	32/62 (52%)	25/50 (50%)
Emotional Regulation		
Mutual Regulation	21/38 (55%)	31/46 (67%)
Self-Regulation	22/40 (55%)	41/56 (73%)
Transactional Support		
Interpersonal Support	65/66 (98%)	64/66 (97%)
Learning Support	41/50 (82%)	50/50 (100%)
Social-emotional Growth Indicators Profile		
Happiness	6/10 (60%)	5/10 (50%)
Sense of self	6/10 (60%)	7/10 (60%)
Sense of others	2/10 (20%)	2/10 (20%)
Active learning & organization	3/10 (30%)	5/10 (50%)
Flexibility and resilience	5/10 (50%)	10/10 (100%)
Cooperation & appropriateness of behaviour	6/10 (60%)	2/10 (20%)
Independence	7/10 (70%)	8/10 (80%)
Social membership and friendships	5/10 (50%)	4/10 (40%)

Appendix F

Standardized and Informal Assessments for School #1 Participant—Liam

PEP-R assessments for Liam

	October 2012 55 months
Developmental Score	72 months
Age	29 months
Quotient	52.7%

SCERTS assessments for Liam

SCERTS Profile Summary	17 Dec 2012
Social Communication	
Joint Attention	18/62 (29%)
Symbol Use	28/50 (56%)
Emotional Regulation	
Mutual Regulation	22/46 (48%)
Self-Regulation	19/56 (34%)
Transactional Support	
Interpersonal Support	66/66 (100%)
Learning Support	50/50 (100%)
Social-emotional Growth Indicators Profile	
Happiness	5/10 (50%)
Sense of self	6/10 (60%)
Sense of others	3/10 (30%)
Active learning & organization	4/10 (40%)
Flexibility and resilience	2/10 (20%)
Cooperation & appropriateness of behaviour	3/10 (30%)
Independence	6/10 (60%)
Social membership and friendships	4/10 (40%)

Appendix G

Standardized and Informal Assessments for School #1 Participant—Joseph

PEP-R assessments for Joseph

	October 2012 59 months
Developmental Score	68 months
Age	27 months
Quotient	45.8%

SCERTS assessments for Liam

SCERTS Profile Summary	17 Dec 2012
Social Communication	
Joint Attention	40/62 (65%)
Symbol Use	25/50 (50%)
Emotional Regulation	
Mutual Regulation	27/46 (59%)
Self-Regulation	27/56 (48%)
Transactional Support	
Interpersonal Support	66/66 (100%)
Learning Support	50/50 (100%)
Social-emotional Growth Indicators Profile	
Happiness	7/10 (70%)
Sense of self	9/10 (90%)
Sense of others	5/10 (50%)
Active learning & organization	4/10 (40%)
Flexibility and resilience	6/10 (60%)
Cooperation & appropriateness of behaviour	5/10 (50%)
Independence	6/10 (60%
Social membership and friendships	7/10 (70%)

Appendix H

Standardized and Informal Assessments for School #2

Participant—Zac

PIVATS (Performance Indicators for Value Added Target Setting) level equivalent for English and Maths. PIVATS is a system in which targets can be set for students who may be performing outside the national expectations. It is appropriate for use with students with special education needs, such as the participants in this study.

PIVATS Assessment for Zac

PIVATS Levels	**Level Equivalent March 2013**
English Reading	1Be
English Speaking and Listening	1Bc
English Writing	1Cc
Maths	1Ab

Appendix I

Standardized and Informal Assessments for School #2 Participant—Eli

PIVATS (Performance Indicators for Value Added Target Setting) level equivalent for English and Maths. PIVATS is a system in which targets can be set for students who may be performing outside the national expectations. It is appropriate for use with students with special education needs, such as the participants in this study.

PIVATS Assessment for Eli

PIVATS Levels	**Level Equivalent December 2012**	**Level Equivalent March 2013**
English Reading	1BP5d	P6e
English Speaking and Listening	P7B	P7a
English Writing	P5c	P6d
Maths	1Ca	1Be

Appendix J

Social Skills Checklist

Name of Child: _____ Date Completed: _____

Birthdate: _____ Teacher or Family Member Completing Form: _____

- ✓ Based on your observations, in a variety of situations, rate the child's following skill level. Put a check mark in the box that best represents the child's (see rating scale below).
- ✓ Write additional information in the comments section.
- ✓ After completing the checklist, place a check in the far right column, next to skills which are a priority to target for instruction.

Rating Scale

Almost Always: The child *consistently* displays this skill in *many* occasions, settings and with a variety of people.

Often: The child displays this skill on a *few* occasions, settings and with a few people.

Sometimes: The child may demonstrate this skill however they *seldom display* this skill.

Almost Never: The child *has never or rarely* displays this skill. In their daily routine, is uncommon to see the child demonstrate this skill.

SECTION 1: SOCIAL PLAY AND EMOTIONAL DEVELOPMENT

Does the Child…	Almost Always	Often	Sometimes	Almost Never	Comments	Priority
1.1 Beginning Play Behaviors						
a. Maintain proximity to peers within 1 foot. *During play, is proximal to peers (does not need to be engaged in play).*						
b. Observe peers in play vicinity within 3 feet. *During play, will watch peers engaged in play.*						
c. Parallel play near peers using the same or similar materials *Parallel play such as building with blocks next to peer who is also playing with blocks.*						
d. Imitate peer (physical or verbal) *Imitate play actions of peer. For example, in dramatic play, peer pretends to eat and child imitates and pretends to eat as well. Imitate verbal action of peer. For example while pretending to eat, will make the chewing sound.*						

Does the Child…	Almost Always	Often	Sometimes	Almost Never	Comments	Priority
e. Take turns during simple games. *Rolls ball back and forth with peer. Plays simple board game with peer.*						
1.2 Intermediate Play Behaviors					**Comments**	
a. Plays associatively with other children. *Shares toys and talks about the play activity even if the play agenda of the other child may be different.*						
b. Respond to interactions from peers. *Put out hand to accept toy from a peer. Answer questions from peers.*						
c. Return and initiate greetings with peers. *Waves hand to greet or says "hello".*						
d. Know acceptable ways of joining in an activity with others. *Observes peers at playing with blocks and asks to join in "can I play?" or offers a block to put on the structure they are building.*						
e. Invites others to play. *Ask a peer to play or offers toy to peer.*						
f. Take turns during structured games/activities. *During social games or board games, will wait for turn and take turn when appropriate.*						
g. Ask peers for toys, food and materials. *Asking (with pictures or speech) in a variety of ways such as "Can I have _____?"*						
1.3 Advanced Play Behavior					**Comments**	
a. Play cooperatively with peers. *Take on pretend role during dramatic play, lead the play by offering play suggestions to peers, and follow game with rules.*						
b. Make comments to peers about what he/she is playing. *When drawing will remark, "I am drawing a train" or when playing with plastic animals will comment, "The shark is swimming in the ocean."*						

Does the Child…	Almost Always	Often	Sometimes	Almost Never	Comments	Priority
c. Organize play by suggesting play plan. *Might suggest, "Let's make a train track and then drive the trains."*						
d. Follow another peers play ideas. *If peer suggests to make a train track and to drive the trains, the child will join the play to make a track.*						
e. Take turns during unstructured activities. *When playing with art materials that are limited, the child will wait for a turn for the scissors. When playing grocery store in dramatic play, the child will wait for turn to be the cashier.*						
f. Give up toys, food and materials to peers. *If peer asks for a turn, the child will share their toy with the peer.*						
g. Offer toys, food and materials to peers. *When playing in the sand, will offer peer shovel to play with.*						

SECTION 2: EMOTIONAL REGULATION

2.1 Understanding Emotions					Comments	
a. Identify likes and dislikes. *When asked if they like ice cream the child will say yes or no. The child will be able to talk about things they like and dislike.*						
b. Label and identify emotions in self. *If their toy breaks, and the child is sad, they can label that emotion accurately when asked, "How do you feel?"*						
c. Label and identify emotions in others. *If a peer is angry, the child will be able to say, "He is mad."*						
d. Justify an emotion once identified/labeled. *If a girl is crying the child can say, "She is crying because she fell down and is hurt."*						
e. Demonstrate affection toward peers. *Gives hugs or handshakes to peers.*						

Does the Child…	Almost Always	Often	Sometimes	Almost Never	Comments	Priority
f. Demonstrate empathy toward peers. *If a peer falls down, the child may help them get up or ask if they are okay.*						
g. Demonstrate aggressive behavior toward others. *Physical aggression towards peers (hitting, kicking, throwing objects, etc.).*						
h. Demonstrate aggressive behavior toward self. *Physical aggression toward self (hitting, pinching, hitting head, etc.).*						
i. Demonstrate intense fears. *The child will not go near dogs and becomes upset when a dog is near.*						
j. Uses tone of voice to convey a message. *When the child is sad, he/she uses a quiet voice or when saying "Stop" uses a firm voice.*						
2.2 Self Regulation					**Comments**	
a. Allow others to comfort him/her if upset or agitated. *Allows caregiver or familiar adult to give them a hug or peers to pat their back.*						
b. Self regulate when tense or upset. *Calms self by counting to 10, taking a breath, taking a break, etc.*						
c. Self regulate when energy level is high or low. *If energy level is high, the child may count to 10 or squeeze a squishy ball. If energy level is low, the child may walk around the room or jump on a trampoline.*						
d. Use acceptable ways to express anger or frustration. *Says, "I'm mad" when angry or asks to take a break when frustrated.*						
e. Deals with being teased in acceptable ways. *When teased, the child ignores, walks away or tells an adult.*						

Does the Child…	Almost Always	Often	Sometimes	Almost Never	Comments	Priority
f. Deals with being left out of a group. *If peers are playing a ball game and the child is not asked to join in or is excluded from the game, they may ask to join in, seek help from an adult or make another play choice.*						
g. Requests a "break" or to be "all done" when upset. *When building with interlocking blocks the child becomes frustrated and asks to take a break.*						
h. Accepts not being first at a game or activity. *During a group game, the child does not have the first turn and does not protest and will participate in the game.*						
i. Says "no" in an acceptable way to things he/she doesn't want to do. *During a non-preferred activity, the child will say, "No", "No thanks" or "I'm done."*						
j. Accepts being told "No" without becoming upset/angry. *When the child is told that they cannot have the object or activity, they accept without becoming upset.*						
k. Deals with winning appropriately. *If a child wins the game, they do not brag to their peers.*						
l. Accepts losing at a game without becoming upset/angry. *If a child does not finish first in the game, they do not protest, may say, "That's okay…maybe next time" or congratulate the winner.*						
2.3 Flexibility					**Comments**	
a. Accepts making mistakes without becoming upset/angry. *For example, if a child is drawing a picture and they make an unintended mark, the child does not rip up their paper.*						

Does the Child…	Almost Always	Often	Sometimes	Almost Never	Comments	Priority
b. Accept consequences of his/her behaviors without becoming upset/angry. *The child does not complete a task and has to stay in from recess to finish the task.*						
c. Ignore others or situations when it is desirable to do so. *During class, a peer is inappropriate, the child ignores and does not imitate. For example, if a child is "being silly" and not listening to the teacher, the child ignores and keeps attending to the teacher.*						
d. Accepts unexpected changes. *During the school day there is a fire drill and the child goes along with change.*						
e. Accepts unexpected changes. *The child goes along with the routine if there is a different teacher, activity or a change in schedule.*						
f. Continue to try when something is difficult. *The child is trying to put a toy together and the pieces don't fit, but they persist to put the pieces together.*						
2.4 Problem Solving					**Comments**	
a. Claim and defend possessions. *For example, if a peer takes the child's trading cards, the child will try to hold on to them or say "That's mine."*						
b. Identify/define problems. *If two children want the same toy, the problem is two children want one toy.*						
c. Generate solutions. *If an art project rips, the child may suggest getting tape to fix it or making a new one.*						
d. Carry out solutions by negotiating or compromising. *Two children want the same toy and the child suggests they have to take turns, do "Eeney meaney miney mo" or sets a timer to show when a turn is over.*						

SECTION 3: GROUP SKILLS

Does the Child…	Almost Always	Often	Sometimes	Almost Never	Comments	Priority
3.2 Participate in Group					**Comments**	
a. Seek assistance from adults. *If the child needs help to zip their coat, they will seek out an adult and request help.*						
b. Seek assistance from peers. *If the child is trying to get a toy to work, they will ask a peer to help them.*						
c. Give assistance to peers. *If a peer is trying to get a toy to work, the child will try to help them.*						
3.2 Participate in Group					**Comments**	
a. Respond/participate when one other child is present. *During a small group, the child will participate. For example, if another peer is playing in the sensory table, the child will participate as well.*						
b. Respond/participate when more than one other child is present. *During a large group, the child will participate. For example, during circle with multiple peers, the child will sing along.*						
c. Use appropriate attention seeking behaviors. *When seeking attention, the child will call someone's name or tap their shoulder.*						
3.3 Follow Group					**Comments**	
a. Remain with group. *During class or community activities, the child stays proximal to peers and with the group.*						
b. Follow the group routine. *During class or home routines, the child follows and sequences steps of the routine.*						
c. Follow directions. *The child is able to follow and sequence directions with two or more steps.*						
d. Make transition to next activity when directed. *For example, follows along with the activities and transitions between activities.*						

Does the Child…	Almost Always	Often	Sometimes	Almost Never	Comments	Priority
e. Accept interruptions/unexpected change. *For example, if the child is building with blocks and the teacher says it's time to be done before the child can finish building; the child will stop and clean up.*						

SECTION 4: COMMUNICATION SKILLS

4.1 Conversational Skills					Comments	
a. Initiate a conversation around specified topics. *Child asks peers, "Guess what I did yesterday?" or "Did you see this movie?"*						
b. Initiate conversations when it is appropriate to do so. *The child initiates at recess and not during a time for quiet independent work at school.*						
c. Ask "Wh" questions for information. *Child will ask "Where are my shoes?" or "Who is that girl?"*						
d. Respond to "Wh" questions. *Answers a variety of "Wh" questions (what, where, when, who, why) both in context and about past or future events.*						
e. Respond appropriately to changes in topic. *If peer changes the topic from skiing to swimming, the child will now talk about swimming.*						
f. Make a variety of comments, related to the topic, during conversations. *If a friend says, "I have a blue truck." The child responds, "I have a green truck."*						
g. Ask questions to gain more information. *When seeing a novel toy, the child may ask what it is or what does it do.*						
h. Introduce him/herself to someone new. *When meeting someone new, the child will say their name.*						

Does the Child…	Almost Always	Often	Sometimes	Almost Never	Comments	Priority
i. Introduce people to each other. *When two people the child knows meet, the child will introduce them to each other by giving their names.*						
j. Demonstrate the difference between telling information and asking for more information. *For example, when talking about a movie the child can tell information about the movie. Also, if someone else is talking about a movie, the child can ask questions about the movie.*						
4.2 Nonverbal Conversational Skills					**Comments**	
a. Maintain appropriate proximity to conversation partner. *The child does not stand too close or touch other person.*						
b. Orient body to speaker. *During a conversation, the child turns their body to the other person.*						
c. Maintain appropriate eye contact. *During a conversation, the child looks in the direction of the other person.*						
d. Use an appropriate voice volume. *When inside a building, does not talk loudly.*						
e. Pay attention to a person's nonverbal language and understand what is being communicated. *For example, if someone shakes their head that means "No" and nodding your head means "Yes".*						
f. Wait to interject. *During a conversation, the child waits until there is a pause or the other person stops talking before they begin talking.*						
g. Appropriately interject. *During a conversation, the child says, "Guess what?" or "Do you know what I did?"*						
h. End the conversation appropriately. *When the conversation is over the child says, "I have to go now" or "See you later".*						

Does the Child…	Almost Always	Often	Sometimes	Almost Never	Comments	Priority
4.3 Questions					**Comments**	
a. Answer "Yes/No" questions. *Will state "Yes/No" accurately to questions.*						
b. Answer simple social questions (e.g., name, age, hair color, address). *Can answer questions such as, "What is your name or age or phone number?" or "Who are the people in your family?"*						
c. Answer subjective questions. *Asks questions such as "What do you like to eat/drink?" or "What is your favorite color/video?"*						
d. Respond to simple "Wh" questions. *Can answer questions such as "What color is that ball?" or "Where are your shoes?"*						
e. Ask questions to gain more information. *If a peer is sharing a toy, the child may ask "How does it work?" or "What is it?"*						
f. Answer questions about past events. *Can answer questions such as "What did you have for lunch?" or "Where did you go for vacation?"*						
g. Stay on topic by making comments or asking questions related to the topic. *If talking about music, the child makes a comment or asks a question about music and not about action heroes.*						
h. Use "Please" and "Thank you" at appropriate times. *When requesting, the child says "Please." When receiving an item the child says "Thank you."*						
4.4 Compliments					**Comments**	
a. Give compliments to peers. *Says, "I like _____."*						
b. Appropriately receive compliments. *Says, "Thank you" to reciprocate compliment.*						

Appendix K

Name: _____

PARTICIPANT QUESTIONNAIRE

Research Project: *Comparing the effectiveness of video modelling and point-of-view video modelling as a social skills intervention for students with autism.*

What do you think about the video?

 like

 dislike

---

What do you think about playing with friends?

 like

 dislike

---

What do you think about playing with the toys?

 like

 dislike

---

Appendix L

Name: _____

PARENT QUESTIONNAIRE

Research Project: *Comparing the effectiveness of video modelling and point-of-view video modelling as a social skills intervention for students with autism.*

Please circle the appropriate number which best represents your answer.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. My child's imitation skills have improved over the course of this research study.	5	4	3	2	1
2. My child's turn taking skills have improved over the course of this research project.	5	4	3	2	1
3. My child's imaginative play skills have improved over the course of this research project.	5	4	3	2	1
4. I would be interested in learning how to use video modeling at home.	5	4	3	2	1
5. I would be interested in learning how to use video modeling in the community.	5	4	3	2	1

Appendix M

Name: _____

TEACHER QUESTIONNAIRE

Research Project: *Comparing the effectiveness of video modelling and point-of-view video modelling as a social skills intervention for students with autism.*

Please circle the appropriate number which best represents your answer.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. My students have improved their imitation skills over the course of this research study.	5	4	3	2	1
2. My students have improved their turn taking skills over the course of this research project.	5	4	3	2	1
3. My students have improved their imaginative play skills over the course of this research project.	5	4	3	2	1
4. I would be interested in learning how to use video modeling in my lessons.	5	4	3	2	1
5. I would be interested in learning how to use video modeling to support my students while they are out in the community.	5	4	3	2	1

Appendix N

Cover Sheet for School Administrator

Dear _____:

I am a doctoral student at Newcastle University, England in the School of Education and Communication and Language Sciences. I am carrying out research for my thesis under the supervision of Drs Sue Pattison and Simon Gibbs who can be contacted by email at susan.pattison@ncl.ac.uk and simon.gibbs@ncl.ac.uk and by telephone +44 (0) 191 222 7368 and +44 (0) 191 222 6575.

I have an extensive background as a Special Education Teacher for over 15 years in the United States of America for students with special education needs. In addition to holding a teaching credential for students with moderate to severe disabilities, I have a Masters in Educational Administration and a Masters in Autism. I am happy to provide a copy of my CV and CRB Enhanced Disclosure upon request.

The topic of my thesis focuses on students with autism and the aim is to provide a social skills intervention program using technology and interactions with typically developing peers. The results of this research will be useful for educators by providing them the tools to imbed cost-effective, time efficient and non-intrusive intervention programs for students with autism into an existing classroom curriculum.

It is anticipated that this intervention will take place over eight weeks (2 weeks for initial set-up and 6 weeks of intervention). Additionally, there will be a one-time observation week one month following the completion of the intervention phase. The enclosed Information Sheet will provide you with specific details on this research project.

If you are willing to allow access to the students and classrooms at _____ for this research, please provide your consent on the form below. All data will remain anonymous and will only be used for academic purposes relating to this study. Your participation will be much appreciated.

If you have any queries or concerns regarding the content, please contact my supervisors or myself.

Yours Sincerely,

Angela Guta
a.j.guta@newcastle.ac.uk
Doctoral Student, Newcastle University, Durham, England
School of Education and Communication and Language Sciences

.....

I ..... do/do not give consent for Angela Guta to have access to the students and classrooms at _____ for the study described above.

Signed:.....Date:.....

Appendix O

INFORMATION SHEET

Research Project: Comparing the effectiveness of video modelling and point-of-view video modelling as a social skills intervention for students with autism.

This research project focuses on students with autism and the development of their social skills. The aim of the research is to determine which model of intervention (video modelling or point-of-view video modelling) will increase social skills at a higher level.

The research will be conducted by Angela Guta, doctoral student at Newcastle University, England in the School of Education and Communication and Language Sciences.

The following participants will be invited to participate in the research:

- Children ages 3-7 who have a diagnosis of autism
- Children ages 3-7 who are typically developing, without any known diagnosis (peer models)

Participation in this project is voluntary and involves no unusual risks to you or your child. You may rescind your permission at any time with no negative consequences. Your child can refuse to participate or withdraw from the project at any time with no negative consequences (e.g. their grades, right to receive services, etc.).

The expected research approaches are as follows:

- A review of school records.
- Teacher interview.
- A social skills rating scale will be completed by the researcher on all participants in the study.
- Students will be asked to watch a brief video (2-5 minutes) which will provide instruction on social skills.
- Students will participate in a play activity with their peers (students with and without autism).
- Observational data will be collected by the researcher (on-going throughout the research period).
- Videotaping (on-going throughout the research period) to provide accurate measurement of data collected.

It is anticipated that this intervention will take place over eight weeks (2 weeks for initial set-up and 6 weeks of intervention). Additionally, there will be a one-time observation week one month following the completion of the intervention phase.

This research project has been approval by Newcastle University's Humanities and Social Sciences Ethics Committee.

If you have any questions regarding this research project, please do not hesitate to contact me at a.j.guta@newcastle.ac.uk, or my doctoral supervisors Drs Sue Pattison and Simon Gibbs who can be contacted by email at susan.pattison@ncl.ac.uk and simon.gibbs@ncl.ac.uk and by telephone +44 (0) 191 222 7368 and +44 (0) 191 222 6575.

Thank you for your time and consideration of this project.

Sincerely,

Angela Guta
a.j.guta@newcastle.ac.uk
Doctoral Student, Newcastle University, Durham, England
School of Education and Communication and Language Sciences

Appendix P

Cover Sheet for Parents of Participants with Autism

Dear Parent/Carer

My name is Angela Guta and I am a full time doctoral student at Newcastle University, England in the School of Education, Communication and Language Sciences. I have an extensive background as a Special Education Teacher for over 15 years in the United States of America for students with special education needs. In addition to holding a teaching credential for students with moderate to severe disabilities, I have a Masters in Educational Administration and a Masters in Autism. I am happy to provide a copy of my CV and CRB Enhanced Disclosure upon request.

As part of my research project, I intend to observe students with autism in social interactions with typically developing peers, after they have watched a brief video teaching them a social skill. The overall aim is to provide a social skills intervention program involving the use of technology and typically developing peers.

Therefore, I am asking for your consent for your child's participation in this research project. As part of the research, your child will be observed, and videotaped for follow-up recording of data. The research process will not interfere with any of your child's learning. Your child's name and any other details will remain anonymous. The videotapes of your child will be used solely for the purpose of collecting and analyzing data on your child's social skills. The videotapes will be viewed by myself, my supervisory team and the board of examiners.

The enclosed Information Sheet will provide you with specific details on this research project. Participation in this study is voluntary. You may request that your child be withdrawn from this study at any time. If your child is withdrawn from the study, any corresponding data on your child will then be destroyed.

I would appreciate it if you would permit your child to participate in this project, as I believe it will contribute to furthering our knowledge of social skills development for children with autism. Please complete the attached permission form, whether or not you give permission for your child to participate, and return it to the school by Wednesday, 19th December 2012.

If you have any questions please do not hesitate to contact me at a.j.guta@newcastle.ac.uk. You may also contact my doctoral supervisors Drs Sue Pattison and Simon Gibbs by email at susan.pattison@ncl.ac.uk and simon.gibbs@ncl.ac.uk and by telephone +44 (0) 191 222 7368 and +44 (0) 191 222 6575.

Sincerely,

Angela Guta
a.j.guta@newcastle.ac.uk
Doctoral Student, Newcastle University, Durham, England
School of Education and Communication and Language Sciences

Appendix Q

PARENT CONSENT FORM
for participation in the following research project:

Comparing the effectiveness of video modelling and point-of-view video modelling as a social skills intervention for students with autism.

Please indicate below your decisions regarding the various parts of this research project:

YES, I give my permission for my child _____ to participate in this study which includes interviewing my child's teacher, obtaining information from my child's school records, observation of my child, and videotaping of my child.

_____(Parent/Guardian printed name)

_____(Parent/Guardian signature)

_____Date

NO, I do not give my permission for my child _____ to participate in this study.

_____(Parent/Guardian printed name)

_____(Parent/Guardian signature)

_____Date

Please return this page to your child's school by _____

Appendix R

Cover Sheet for Parents of Mainstream Participants

Dear Parent/Carer

My name is Angela Guta and I am a full time doctoral student at Newcastle University, England in the School of Education, Communication and Language Sciences. I have an extensive background as a Special Education Teacher for over 15 years in the United States of America for students with special education needs. In addition to holding a teaching credential for students with moderate to severe disabilities, I have a Masters in Educational Administration and a Masters in Autism. I am happy to provide a copy of my CV and CRB Enhanced Disclosure upon request.

As part of my research project I intend to observe students with autism in social interactions with typically developing peers, after they have watched a brief video teaching them a social skill. The overall aim is to provide a social skills intervention program involving the use of technology and typically developing peers.

Therefore, I am asking for your consent for your child to participate in this research project as a peer model. This process will involve two steps.

- First, as part of the research, your child will be videotaped in a play activity (i.e. initiating play, sharing, taking turns, pretend play, and cooperative play). The videotaping process will not interfere with any of your child's learning. Your child's name and any other details will remain anonymous. The videotapes of your child will be used solely for the purpose of this research project. As part of this research project, participants in the study who have autism will view the videotape of your child demonstrating a social skill. Additionally, the videotapes will be viewed by myself, my supervisory team and the board of examiners.
- Second, your child will be asked to participate in a play activity with children with autism. During the play activity, your child will be videotaped along with the children with autism. The videotapes will be used solely for the purpose of collecting and analyzing data on the social skills of the children with autism. Participation in this study is voluntary. You may request that your child be withdrawn from this study at any time. If your child is withdrawn from the study, any corresponding data on your child will then be destroyed.

Only the researcher will have access to the information collected in this project, which will be kept in locked storage at the university following the completion of the research. Neither your name nor your child's name will appear in any reports of this research.

I would appreciate it if you would permit your child to participate in this project, as I believe it will contribute to furthering our knowledge of social skills development for children with autism. Please complete the attached permission form, whether or not you give permission for your child to participate, and return it to the school by Wednesday, 19th December 2012.

If you have any questions please do not hesitate to contact me at a.j.guta@newcastle.ac.uk. You may also contact my doctoral supervisors Drs Sue Pattison and Simon Gibbs by email at susan.pattison@ncl.ac.uk and simon.gibbs@ncl.ac.uk and by telephone +44 (0) 191 222 7368 and +44 (0) 191 222 6575.

Sincerely,

Angela Guta
a.j.guta@newcastle.ac.uk
Doctoral Student, Newcastle University, Durham, England
School of Education and Communication and Language Sciences

Appendix S

PARENT CONSENT FORM FOR PEER MODEL
for participation in the following research project:

Comparing the effectiveness of video modelling and point-of-view video modelling as a social skills intervention for students with autism.

Please indicate below your decision regarding this research project:

YES, I give my permission for my child _____ to participate in this study which will involve my child being videotaped in a play activity (i.e. initiating play, sharing, taking turns, pretend play, and cooperative play).

_____(Parent/Guardian printed name)

_____(Parent/Guardian signature)

_____Date

NO, I do not give my permission for my child _____ to participate in this study.

_____(Parent/Guardian printed name)

_____(Parent/Guardian signature)

_____Date

Please return this page to your child's school by _____

Appendix T

Farm VM Script (from video)

Title page "Let's Play Farm" Narrated "Let's Play Farm"

Person	Verbalization	Action
1	"Let's play farm."	
2	"Yeah."	Raising his arms up in the air.
2	"I want to be the farmer."	Holds up farmer
1	"I want to be the helper."	Holds up helper
3	"I'll be the girl."	Holds up girl
1	"Cocka-doodle-do"	Slides rooster L-R-L-R
2	"I'll let the animals out."	Opens doors to barn, begin to bring out animals (sheep/cows).
3	"I'll help."	Helps bring out animals.
1		Walks helper around as they bring animals out.
2	"Can you get the food?" Towards helper	
1	"Sure, I'll get it."	Walks helper towards bucket.
3	"Can I come, please, please?"	Moves girl up and down.
1	"Sure you can. Come along."	Helper holding bucket. Moving helper as he talks.
3	Yippee	Walks girls towards helper then moves girl up and down as she talks.
1	"Sit down the bucket and they will eat it."	Girl sits bucket down and brings two cows towards it.
	"Moo" then eating sound	
1	"Now the pig"	Brings pig out of barn, places him in front of the other bucket.
1	"Oink" then eating sound	Pig is in front of the bucket.
2	"Time to feed the horses" "I'll be back"	Moves farmer up and down. Takes blue wheelbarrow with hay on it towards horses.
2	"There you go."	Dumps hay out of the wheelbarrow.
2	"There you go. You were hungry."	Puts hay in front of horses. Then lifts farmer in the air while talking.

2		Walks back with empty wheelbarrow.
1	“Time to clean the stables.”	Moves helper up and down, walks toward barn, moves helper with a side-to-side motion in stable area (as if cleaning it).
3	“I’ll clean the pig area.”	Move girl with a side-to-side motion in pig area (as if cleaning it).
2	“I’ll clean the cows’ area.”	Move farmer with a side-to-side motion in stable area (as if cleaning it).
3	“It’s getting dark.”	Holds girl up in the air while talking.
2	“Time to bring the animals in.”	Holds farmer up in the air while talking.
1	“I’m tired.”	Moves helper up and down.
2	“Let’s get some sleep.”	Holding his farmer while talking.
All 3	“Good Night.” “Good night.”	All 3 characters are put in the top story of the barn in a lying down position.
3	“This was fun.”	
1	“Yeah, I like playing farm.”	
2	“Me too.”	

Title page	“Good Playing Farm”	Narrated “Good Playing Farm”
Title page	“All finished!”	Narrated “All finished!”

Appendix U

Farm POVM Script (from video)

Title page "Let's Play Farm" Narrated "Let's Play Farm"

Person	Verbalization	Action
1	"Let's play farm."	
2	"Yeah."	
2	"I want to be the farmer."	Holds farmer
1	"I want to be the helper."	Holds up helper
3	"I will be the girl."	Holds up girl
1	"Cocka-doodle-do" "Time to feed the animals."	Slides rooster L-R-L-R
2	"I'll let the animals out."	Holding farmer while talking. Takes pig and two cows out.
3	"I'll help."	Helps bring out a cow.
2	"Can someone get the food?"	
1	"Sure, I'll get it."	Holds up helper and bucket.
3	"Can I come, please, please?"	Moves girl up in air.
1	"Sure you can. Come along."	Girl moves towards helper. Helper holding bucket then moves bucket to a cow.
1	"Sit down the bucket. They will eat it."	See girl's hand sitting bucket down in front of the cows.
	"Moo" then eating sound	
1	"I'll take the pig to the bucket instead."	Moves pig toward bucket.
1	"Oink, oink" then eating sound	Pig is in front of the bucket.
2	"Time to feed the horses"	Moves farmer from side to side. Takes blue wheelbarrow with hay on it towards horses, dumps hay out. Singing a jingle "do do do do do do - do do do do do dooooo" Then walks farmer away with empty wheelbarrow singing "do do do do do – do do"
2	"There you go. You were hungry." Eating sound.	Holds farmer in one hand and uses other hand to bring 3 horses to stand around the hay.

Farm POVM p1

1	“Time to clean the stables.”	Move helper up and down, then seen by pig door.
3	“I’ll clean the pig area.”	Move girl with a side-to-side motion in pig area (as if cleaning it).
1	“All done.”	
2	“I’ll clean the cows’ area.”	Reaches for cow area but peer moves in to clean sheep area, so he cleans pig area with side-to-side motion (as if cleaning it).
1	“I’ll clean the sheep area”	Moves sheep out of stable, then moves helper side-to-side (as if cleaning it).
3	“It’s getting dark.”	Holds girl up in the air while talking.
2	“Time to bring the animals in.”	Holds farmer up in the air while talking. All 3 characters move animals in (cows, sheep, and pig). Closes white doors (cow) and yellow door (pig).
2	“Shut.”	Closes cow door.
1	“I’m tired.”	Holds helper up while talking.
2	“Let’s get some sleep now.” (in a sing-song voice)	Holding his farmer, moves his head from side to side.
All 3	“Good Night.” “Good night.” “Good Night.”	All 3 characters are put in the top story of the barn in a lying down position.
3	“This was fun.”	
1	“Yeah, I like playing farm.”	
2	“Me too.”	

Title page	“Good Playing Farm”	Narrated “Good Playing Farm”
Title page	“All finished!”	Narrated “All finished!”

Appendix V

TOWN VM SCRIPT (from video)

Person	Verbalization	Action
3	"Let's play town."	
1	"Okay."	
3	"I'll be the Mum."	Picks up Mum.
2	"I'll be the boy."	Picks up boy.
1	"I'll be the Post Office worker."	Holds up adult Male.
3	"I need to send a parcel."	Looking at girl.
2	"Look Mum, a toy shop."	Points to toy shop with character.
2	"Can I have a toy?"	Moving boy.
3	"Post office first then the toy shop."	Holding Mum while talking. Mum and boy walk to post office.
		Mum enters the post office. Post office is turned around. Post office worker is placed inside, and Mum and boy.
3	"I need to send this parcel."	
1	"50 pence please."	
3	"Here you go."	Holding Mum
1		Rings cash register
3	"Thank you." "Now the toy shop."	Moving Mum. Walks out of the post office.
		Mum and boy walk to toy shop. Open toy shop door then turns toy shop around to enter from the back.
2	"Look trains. Can I have one please?"	Holding boy.
3	"Okay. Just one. Do you want a blue or the red one?"	Moving Mum character while talking.
2	"Red one please."	
1	"That will be 2 pounds."	Turns toy shop so the toy shop worker can enter it. Moving toy shop worker.
3	"Here you go."	Moves Mum towards shop worker.
1	"Here's your change back."	Moving worker.

Town VM p1

		Opens door. Mum and boy walk out of toy shop ringing the welcome mat as they leave. Walk towards the tea shop.
2	"I will shut the door."	Open door to the tea shop. Mum and boy enter. Door is closed.
2	"Mum I want cake."	
3	"Okay, just one." "Let's go upstairs to eat it."	Walk around building pretending to go upstairs. Cake display is placed on the corner of the balcony. Both make eating sounds.
3	"Time to go now."	Both pretend to go downstairs.
2	"Walk, walk, walk, walk, walk, walk. Come out the door and away."	Going downstairs then out the door.
1	"Nee naw, nee naw, nee naw."	Moves police officer in motorcycle across town.
2	"Look, police. I wonder where they are going."	Holding boy.

Title Page: Good playing town! Narration: "Good playing town!"

Title Page: All Finished! Narration: "All Finished!

Appendix W

Town POVM Script (from video)

Person	Verbalization	Action
3	"Let's play town."	
1	"Okay."	
3	"I'll be the Mum."	Holds up Mum.
2	"I'll be the boy."	Holds up boy.
1	"I'll be the Post worker."	Holds up adult Male.
3	"I need to send a parcel."	Holds up Mum.
2	"Look Mum, a toy shop."	Points to toy shop with character.
2	"Can I have a toy?"	Moving boy in up and down motion.
3	"Post office first then toy store."	Holds up Mum while saying it. Mum and boy walk to the post office.
		Boy enters post office, ringing welcome mat. Post office is turned around. Post office worker is placed inside, then Mum.
3	"I need to send this parcel."	Hand on Mum. Hand on worker.
1	"50 pence please."	
3	"Here you go."	Holding Mum.
1	"Thank you."	
3	"Now the toy shop."	Holds up Mum.
2	"Look trains. Can I have one?"	Moving boy in front of shop.
3	"Okay. Just one. Do you want the blue or the red one?"	
2	"Red one please."	
1	"That's 2 pounds please."	Hand on toy shop worker inside. Rings cash register.
3	"Here you go. Thank you."	Moves Mum inside toy shop.
2	"Thanks Mum. I'm hungry."	Moves boy as he is talking.
3	"Let's stop for tea."	Moving Mum as she is talking.
1	"Tea shop."	Moves tea shop closer to the characters.
1	"I'll be the baker."	Holds up baker character.

2	“Somebody’s coming.”	Opens door to the tea shop, then rings welcome mat.
		Mum and boy enter the tea shop.
2	“Yummy I want cake.”	See cake display in the window.
3	“Okay, just one.”	
1	“50 pence please. Thank you.”	Holding tea shop worker behind the register.
3	“Here you go.”	
1	“Thank you.”	
3	“Let’s go upstairs to eat it.”	Mum and boy go upstairs. Cake display is placed on the corner of the balcony. Eating sounds.
3	“Time to go now.”	Both pretend to go downstairs.
2	“Walk downstairs. Walk downstairs, walk downstairs. I’m out.”	Going downstairs then out the door.
3	“Walk downstairs, walk downstairs, walk downstairs, walk downstairs.”	Going downstairs then out through the door.
		Mum and boy walking away from tea shop.
1	“Nee naw, nee naw, nee naw, nee naw.”	Moves police officer in motorcycle across town.
2	“Look, police. I wonder where they are going.”	Moves boy

Title Page: Good playing town!

Narration: “Good playing town!”

Title Page: All Finished!

Narration: “All Finished!”

Appendix X

Pirates VM Script (from video)

Title page: "Let's Play Pirates!" Narration: "Let's Play Pirates!"

Person	Verbalization	Action
2	"Let's play pirates."	
1	"Okay. I'll be the captain."	Holding up the captain.
1	"On board mateys."	Places captain at wheel, #2 also helps put pirates on different places on the ship. One is also placed on the extendable gang plank.
1	"Guard your stations." "We're off to find the treasure." "Steer to the right."	#2 turns ship to steer to the right.
1	"Straight ahead."	#2 steering wheel.
1	"We're nearly there."	#2 steering wheel.
2	"The island is up ahead."	Steering wheel.
1	"Drop the anchor."	
2	"Okay."	Puts down both extendable gang planks.
1	"You stay on the ship. Youse two stay on the ship." "Guard it."	Takes captain off the ship, onto the gang plank then on the table facing ship while talking.
2		Takes three pirates off the ship and stands them next to the captain.
1 and 2		Walk the men together to one side of the table.
2	"Captain, where is the treasure?"	Moving one of the pirates.
1	"Follow the map."	Turns captain to face men.
2	"Where is it?"	
1	"Here is the tree by the stream."	Facing captain forward.
2	"Let's dig."	
1 and 2	"Phwet, phwet, phwet, phwet, tunk."	Moving pirates as if digging. Then #2's pirate hits the table while saying "tunk"
2	"I've hit something."	
1	"Let's pull it out."	

Pirates VM p1

2	“ugh”	Pretends to pull out treasure.
2	“It’s the treasure.”	Moving his pirate.
1	Whistle sound.	
1	“Look at this, gold, jewels and a crown.”	Moving captain.
1 and 2	“Whee.”	
2	“Quick.”	Both start walking pirates back to the ship.
1	“Back to the ship.”	Walking pirates to the ship.
2	“Phwet.”	Opens back door, placing treasure inside then continue onto ship.
		Both bring pirates onto the ship, with captain at the wheel. Close the back door then the side gang planks.
1	“Let’s go back to the hide out.”	
2	“Aye, aye captain.”	Turns wheel. Turns ship around.
2	“That was fun.”	Smiles.
1	“Yeah, I like playing pirates.”	
2	“Yeah, me too.”	

Title Page: Well done playing pirates!

Narration: “Well done playing pirates!”

Title Page: All Finished!

Narration: “All Finished!”

Appendix Y

Knights VM Script (from video)

Title page: “Let’s Play Knights!” Narration: “Let’s Play Knights!”

Person	Verbalization	Action
1	“Let’s play knights.”	
2	“Okay.”	
1	“Sound the trumpet.” “Doo, doo, doo, doooo” “Doo, doo, doo, doooo”	Put both hands to his mouth (in a cupped position) to make a trumpet sound.
1	“The enemy is approaching.” “Get all cannons.”	
1	“John, Leon go to the top.”	#1 moves white knight up ladder #2 moves black knight up from the back to the roof behind the catapult.
2	“Joe you’re with me.”	
1	“Bring up the drawbridges.”	Both close the side drawbridges.
2	“Close the doors.” “ugh, ugh”	Closes front doors then helps #1 close roof door.
2		Places small cannon towards edge of the roof in front of the roof door.
2	“Pull up the ladder.”	Holding white knight on roof, pulls up ladder. #1 helps him pull it up. Ladder falls behind castle.
1	“Jack command the small cannon.”	
2		Walks white knight to behind the small cannon.
1	“On my count.” “Ready, aim, fire.”	#1 holds big cannon with finger ready to shoot. #2 has finger on catapult. Both shoot big cannon and catapult at the same time. #1 then shoots small cannon.
2	“Reload.”	Gather all balls, reload.
1	“Ready, aim, fire.”	#2 and #1 shoot catapult and big cannon together. #2 then shoots small cannon.

1	“Reload.”	Gather all balls, reload.
1	“Ready, aim, fire.”	#2 shoots catapult and small cannon at the same time. #1 shoots the big cannon at the same time.
		They gather all balls then reload.
1	“The enemy is gone.” “Well done men.”	Moving three knights to in front of the big cannon.
2	“That was cool.”	
1	“Yeah I like playing knights.”	

Title Page: Well done playing knights!

Narration: “Well done playing Knights!”

Title Page: All Finished!

Narration: “All Finished!”

Appendix Z

Social Skills Checklist Pre- and Post-Intervention Results for School #1*

	Pre-Intervention				Post-Intervention			
Does the child…	**Almost Always**	**Often**	**Sometimes**	**Almost Never**	**Almost Always**	**Often**	**Sometimes**	**Almost Never**
1.1 Beginning Play Behaviors								
a. Maintain proximity to peers within 1 foot.	3	3	2	2	1	4	4	1
b. Observe peers in play vicinity within 3 feet.	4	3	3		3	3	4	
c. Parallel play near peers using the same or similar materials.	3	1	4	2		3	5	2
d. Imitate peer (physical or verbal)		2	2	6			5	5
e. Take turns during simple games.	1	3	4	2		1	5	4
1.2 Intermediate Play Behaviors								
a. Plays associatively with other children.		2	3	5			3	7
b. Respond to interactions from peers.	1	1	5	3		1	4	5
c. Return and initiate greetings with peers.	1	1	4	4		1	4	5
d. Know acceptable ways of joining in an activity with peers.		1		9		1	1	8
e. Invites others to play.	1		1	8			1	9
f. Takes turns during structured games/activities.		1	8	1	1		6	3
g. Ask peers for toys, food and materials.		2	2	6		1	1	8
1.3 Advanced Play Behavior								
a. Play cooperatively with peers.		2	2	6			1	9
b. Make comments to peers about what he/she is playing.		1	1	8			1	9
c. Organize play by suggesting play plan.			1	9				10
d. Follow another peer's play ideas.			2	8				10
e. Take turns during unstructured activities.		2	2	6			2	8
f. Give up toys, food and materials to peers.		1	6	3		1	4	5
g. Offer toys, food and materials to peers.		1	2	7				10
2.1 Understanding Emotions								
a. Identify likes and dislikes	3	4	2	1	2	1	5	2
b. Label and identify emotions in self.	2		2	5	2	2	3	3
c. Label and identify emotions in	2			8			3	7

	others.								
d.	Justify an emotion once identified/labelled.			3	7			2	8
e.	Demonstrate affection toward peers.	1		2	7		1	2	7
f.	Demonstrate empathy toward peers.			3	7	1		1	8
g.	Demonstrate aggressive behaviour toward others.	1	1	5	3		3	2	5
h.	Demonstrate aggressive behaviour toward self.	2	1	2	5	2		4	4
i.	Demonstrate intense fears.	1	1	3	5		2	4	4
j.	Uses tone of voice to convey a message.	1	1	2	5		2	4	4
2.2 Self Regulation									
a.	Allow others to comfort him/her if upset or agitated.	4	2	4		3	4	2	1
b.	Self regulate when tense or upset.	1	2	2	5		2	6	2
c.	Self regulate when energy level is high or low.	3	2	1	4	2	3	4	1
d.	Use acceptable ways to express anger or frustration.			4	6			4	6
e.	Deals with being teased in acceptable ways.	1		1	4	1			6
f.	Deals with being left out of a group.	1	1	1	3				6
g.	Requests a ‘break’ or to be ‘all done’ when upset.	2	1	3	4	1	1	5	3
h.	Accepts not being first at a game or activity.	5	2	1	1	3	3	2	2
i.	Says ‘no’ in an acceptable way to do things he/she doesn’t want to do.	4	1	2	1	2	4	3	1
j.	Accepts being told ‘No’ without becoming upset/angry.			8	2			7	3
k.	Deals with winning appropriately.	3	1	2		1	2		3
l.	Accepts losing at a game without becoming upset/angry.	3	1		1	3	3		2
2.3 Flexibility									
a.	Accepts making mistakes without becoming angry/upset.	3	2	1	3	1	3	2	3
b.	Accepts consequences of his/her behaviours without becoming upset/angry.			5	2		2	5	3
c.	Ignore others or situations when it is desirable to do so.	2	1	3	2	1	7		2
d.	Accepts unexpected changes.	4		5	1	1	3	5	
e.	Accepts unexpected changes (different qualifier).	3	2	4	1	1	4	4	
f.	Continue to try when something is difficult.	1	4	2	3	1	3	4	2
2.4 Problem Solving									
a.	Claim and defend possessions.	5	2	1	2	2	4	2	2
b.	Identify/define problems.		2	3	4			2	7
c.	Generate solutions.	2		1	7		2	2	6

d. Carry out solutions by negotiating or compromising.				10			2	8
3.2 Participate in Group								
a. Seek assistance from adults.	4	5		1	6	4		
b. Seek assistance from peers.		1		9		1		8
c. Give assistance to peers.				9	1		1	8
3.2 Participate in Group								
a. Respond/participate when one other child is present.	2	2	5	1	1	6	3	
b. Respond/participate when more than one other child is present.	1	2	4	3		3	6	1
c. Use appropriate attention seeking behaviours.	2	2	4	2	3	5	1	1
3.3 Follow Group								
a. Remain with group.	2	2	5	1	3	2	1	4
b. Follow the group routine.	2	2	6		3	3	4	
c. Follow directions.	2	1	4	3	2	2	5	1
d. Make transition to next activity when directed.	1	4	5		1	5	4	
e. Accept interruptions/unexpected change.	1	3	4	1		5	5	
4.1 Conversational Skills								
a. Initiate a conversation around specified topics.			1	7		1		9
b. Initiate conversations when it is appropriate to do so.				8		1		9
c. Ask “Wh” questions for information.	1		2	5	1		2	7
d. Respond to “Wh” questions.			2	6	1	1	2	6
e. Respond appropriately to changes in topic.			1	6			1	9
f. Make a variety of comments, related to the topic, during conversations.		1		7		1	1	8
g. Ask questions to gain more information.		1	1	5		1		9
h. Introduce him/herself to someone new.	2		1	5	1	1		8
i. Introduce people to each other.			1	1	1		1	8
j. Demonstrate the differences between telling information and asking for more information.				8		1		9
4.2 Nonverbal Conversational Skills								
a. Maintain appropriate proximity to conversation partner.	1	4	4	5	2	3	4	1
b. Orient body to speaker		2	7	1		2	7	1
c. Maintain appropriate eye contact.	1	1	7	1		4	6	
d. Use an appropriate voice volume.			4	5	1	3	2	4
e. Pay attention to a person’s nonverbal language and understand what is being communicated.		2	4	4		2	5	3
f. Wait to interject.			1	8			1	8
g. Appropriately interject.				9				9

h. End the conversation appropriately.			1	8				1	8
4.3 Questions									
a. Answer "Yes/No" questions.	2	1	3	2		1	2	3	4
b. Answer simple social questions (e.g., name, age, hair colour, address).	1		3	4		1	1		8
c. Answer subjective questions.	1		1	6			1	2	7
d. Respond to simple "Wh" questions.	2		1	5		2	2	2	4
e. Ask questions to gain more information.		1	1	6			1		9
f. Answer questions about past events.			2	6			1	2	7
g. Stay on topic by making comments or asking questions related to the topic.			2	6			1	1	8
h. Use "Please" and "Thank you" at appropriate times.	1		2	6		2		3	5
4.4 Compliments									
a. Give compliments to peers.			2	7		1	1		8
b. Appropriately receive compliments.		1		8			1	2	7

** Condensed the information to improve readability. Please see Appendix X for entire table*

Appendix AA

Table 46 (in entirety). Zac's unscripted play actions for the pirate play set

Unscripted Play Actions	***Session(s)***
Shot the cannon ball through the air with his hand	1, 29
Placed the cannon ball into the small cannon	1, 2, 5, 17, 27
Shot the small cannon	1, 2, 5, 13, 17, 29
Held small cannon in his hand to shoot it	29
Placed the small cannon on the ship	1, 2, 17
Held a pirate next to the small cannon	1, 29
Handed small cannon over to another pirate	29
Opened trap door	2, 7, 9, 10, 12, 16, 27
Closed trap door	7, 10, 16, 27
Took pirate out of the look-out	2
Opened hatch door	2, 6, 7, 10, 12-14, 17, 18, 26
Placed a pirate inside the hatch	2, 7, 12-14
Removed a pirate from inside the hatch	10, 12-14
Closed door to the hatch	2, 6, 12, 13, 17, 18
Tilted ship on its side while making "phph" sounds	2, 5, 10, 13, 16, 22
Shot the weapon of a pirate	4-6, 9, 12, 13, 23, 29
Caused a pirate to fall over as if shot	29
Placed a pirate in opening under trap door (that is open)	4, 25
Moved the cannon attached to the front of the ship	4, 5, 6, 9, 12
Changed the ship's direction	4
Slid the ship off the table	13
Slid the ship back and forth on its side	25
Extended his hand from the cannon attached to the front of the ship, making the "phph" sounds	4, 12
Moved the sail at the front of the ship	4
Moved the sail back and forth	4, 18
Held a pirate next to the sail making "phph" sounds	13
Held a pirate next to the mast, then he climbed down	6
Placed a piece of the ship back (that had either fallen off or been pulled off)	7, 12, 18
Placed a pirate in back opening	10, 16
Removed a pirate from the back section	7, 10
Hit two pirates together, making "phph" sounds	9, 13, 25, 29
Hit pirate against the side of the ship, making a "phph" sound	10
Hit two pirates together on the ropes	16
Flew one pirate into the air across the boat, chasing another pirate	13
Tapped pirates on the table animating them	20, 21, 23-27
Moved his pirate closer to a peer's pirate while talking to him	21, 23, 26
Jumped a pirate off the side of the ship	22
Placed a pirate on the ship ledge	22

Used one pirate to hit another pirate	22, 26, 27
Placed a pirate on the cross bar above the sail	23, 25, 27
Handed a pirate to a peer to share	25
Jumped pirates onto the ship	25
Titled ship upside down	25
Placed a pirate on the ropes of the ship	25
Moved pirates to pull out the treasure	26
Used pirate to chase another pirate	26
Moved one pirate to hand another pirate the map	27
Moved a pirate to take the treasure from another pirate	27

Appendix BB

Table 47 (in entirety). Zac's unscripted verbalizations for the pirate play set

Unscripted Verbalizations	***Session(s)***
Made the "phph" for the sound of shooting.	1, 2, 4-6, 9. 10, 12, 16, 22, 24-26, 29
"Fire."	1
"I was gonna shoot it right over there."	1
"Fire in the hole."	1
"Did you look at this?"	1
"It's so amazing!"	1
"Watch this."	1, 7
"What happens when you fire at the top of a…"	1
"It's not working."	1
"Right, watch."	1
"Awe."	1
"Ah, jumped them."	2
"Let's have a shoot out."	4, 9
"What's in there?"	4
"It's in the sea."	4
"It's turning around."	4
"The waves are coming."	4
"It's starting to fall."	4
"Ah, it's getting uphill because of him."	4
"I'm the captain and I'm going to…"	4
"He's dead."	5
"You can't have him, he's…"	5
"All right, what's in there?"	5
"What do you put in there?"	5
"Don't know where you're going, you baddy."	5
"Oh, I can't use him, he's dead."	5
"You can't play with him."	5
"Where's the crocodile?"	5
"Oh man, oh look at that."	6
"It's my fault."	6
"Come on it's fun."	7
"Come on mate."	7
"Wow, I'm gonna bring the fire at me."	7
"Put captain on Eli, put captain on."	7
"That was quite funny."	7
"You put the red bit in."	7
"Just a minute Eli."	7
"You put the red."	7
"I can't."	7
"Whoa, wasn't that awesome?"	7
"Right, watch this Miss."	7
"Miss, watch this."	7
"Whoa."	7

“Let’s try it with the door so this time.”	7
“Watch, watch, look, watch, watch.”	7
“Ah, that’s not good.”	7
“How do you open it.”	7
“Where’s your two other pirates?”	7
“Two of them have gone under.”	7
“Oh man, I knocked another one off.”	7
“Where’s the shooting thing?”	7
“I can’t see.”	7
“Oh, there it is.”	7
“Put him in.”	7
“Think you can hide there.”	7
“Right, I’m going to fire this thing into the ship, men.”	7
“Watch on 3.” (then counts down 10-0)	7
“Hey Eli, let’s open this thing.”	7
“I’ve got an idea.”	7
“Oh, nuts.”	7
“Open this.”	7
“I and he’s ready.”	9
“Don’t you get me in the ___.”	9
“I am the captain.”	7, 10
“If it’s the last thing I can do.”	7
“We need to get back to the…”	9
“Oh no, a flag came.”	9
“We need some flags off.”	9
“We need a flag off.”	9
“Put that back Eli.”	9
“Just put that, put that back on.”	9
“Pachow.”	9
“I’m gonna cut us down.”	9
“It’s what I have to do.”	9
“Let’s go and shoot men.”	9
“Hey.”	10
“I’ll, I’ll try to get it.”	10
“I’ll go get it.”	10
“I have a shotgun.”	12
“Stu… Miss.”	12
“Look what you’ve done.”	12
“You broke this.”	12
“There goes the broke.”	12
“Oh no, it’s broken now.”	12
“Oh no.”	12
“There goes the broken.”	12
“Oh no, there goes the broken thing.”	12
“Why does it go there anyways?”	12
“It’s gonna fall in.”	12
“Whoa.”	13
“Whoa the boat is starting to fall, phph, yeow, whoo the boat, oh no.”	13
“Yeah, you’re about to die.”	13
“Stop doing that Eli.”	14

“You’re going to spoil with it Eli…”	14
“You can’t dig, can’t you, peow, captain?”	15
“Remember can’t…can you captain?”	14
“Well…come on, dig up this.”	14
“Let’s see what we got.”	14
“I’m not dead.”	14
“I’m the captain.”	14
“Put the ship down.”	16
“It wasn’t our fault.”	16
“Whoa, it’s falling, whoa.”	16
“Thunder, lightning.”	16
“Don’t you dare.”	16
“I’ve got no place to hide.”	16
“Put that in.”	16
“Cool, this is a hideout.”	16
“Eli can be the…can you be the cannon.”	17
“Why are they fighting?”	17
“Is that my ship…just doesn’t matter.”	17
“Wait for us.”	17
“Ready and fire.”	17
“Hey, get down there captain.”	17
“Look what you just did.”	17
“Well, I don’t have a ___ chest.”	17
“No, hey I’m being him.”	17
“He never asked.”	17
“He never asked can I please borrow your captain.”	17
“He just got it off me.”	17
“He can have it then.”	17
“____ treasure okay?”	18
“Whoa, the ship.”	18
“We have the ship lying down.”	18
“Whoa, everything is falling.”	18
“Can’t we put a hole in it?”	18
“Oh no, phph.”	18
“Aw, now how we supposed to fix it now?”	18
“What yellow flag?”	18
“Oh, it’s right there.”	18
“You mean it’s facing that way?”	18
“Come on everyone, on the ship.”	18
“I’m having the pirate ship.”	18
“Everything’s coming to pieces again.”	18
“What?”	19, 21
“Yeah, let’s go then.”	19
“Maybe, let’s go then.”	19
“I know.”	19
“Whose island is it then?”	19
“Where is the food?”	19
“Let’s go and find the treasure”	19
“Yeah.”	19
“Wow.”	19
“Find the treasure.”	21

“You haven’t got me for a minute.”	21
“Come on man.”	21
“Come on.”	21
“Get on the pirate ship.”	21
“Yeah, not so fast.”	21
“Oh no!”	21
“Not so fast.”	21
“Kill him.”	21
“Come on Steve.”	22
“Let’s find the treasure.”	22
“Come on, let’s then.”	22
“I’m here.”	22
“Yeah, that’s what you get for doing this!”	22
“Yeah man.”	22
“How?”	22
“I feel something.”	22
“I can feel something.”	22
“Right, whoa, whoa, whoa, whoa.”	22
“Well how about, it’s the face kill.”	22
“No.”	22
“Nope.”	22
“The ship is falling down in the sea.”	22
“Oh, it’s falling down the sky.”	22
“Where’s the captain?”	23
“Oh there he is.”	23
“Hello.”	23
“What’s the moaning about?”	23
“What do you moaning for him?”	23
“It’s my ship though.”	23
“What you talkin about?”	23
“I drive it.”	23
“Well I’m no…I’m the captain.”	23
“Ah, I am the monster pirate.”	23
“You’ve got his cannon for what?”	23
“Help me, where’s the treasure?”	24
“Where is it?”	24
“I’m saying, Eli a pirate?”	24
“Okay, you have a pirate.”	24
“Jewels and crown.”	25
“What’s he doing with the cannon?”	25
“The course is mine and I’m…”	25
“Whoa, I knocked it out.”	25
“Oh no, I hit the ground.”	25
“Ah, I got my leg stuck.”	25
“Well, I’m stuck too.”	25
“He’s stuck.”	25
“Don’t look back.”	25
“Jewels crown.”	26
“Walk.”	26
“We’ve got the treasure.”	26
“In fact, it’s time for you two to die.”	26

“But the treasure is not that.”	26
“The treasure is ours.”	26
“I’ve got it, I’ve got…”	26
“Look, I found the treasure.”	26
“It’s in there.”	26
“We’ve found the treasure.”	26
“Youse two should stay behind.”	27
“Okay I, I have a map where the treasure is.”	27
“Why?”	27
“He stole it.”	27
“Come on, let’s get the captain.”	27
“Get off us.”	27
“Give ‘em up.”	27
“Well, give it.”	27
“It’s just some clothes.”	27
“It’s not in there.”	27
“Treasure’s not in there.”	27
“Give the treasure back.”	27
“Okay, have a look…have a look.”	27
“Ready and fire in the hole.”	29
“Oh wait, that’s dope.”	27
“Shoot them.”	29
“Shoot the three pirates.”	29
“You stealed my captain.”	29

Appendix CC

Table 50 (in entirety). Eli's unscripted play actions for the pirate play set

Unscripted Play Actions	***Session(s)***
Opened hatch door	1-5, 7, 8, 10, 11, 13-17, 20, 23, 24, 26
Closed hatch door	1, 3-5, 7, 10, 11, 13-17, 20, 23, 24, 26, 29
Placed pirate inside hatch door opening	3-5, 7, 10, 11, 14, 15, 17, 23, 24
Removed a pirate from under hatch door	3-5, 7, 8, 10, 11, 14, 15, 17, 23, 24
Turned ship to change direction	1, 3
Placed a pirate in the back door opening	1, 12, 13
Removed a pirate from the back door opening	2, 3, 5, 8-13, 23, 25
Loaded small cannon	2, 3, 4, 17, 18, 26
Shot small cannon	2, 3, 4, 18, 26, 27
Opened trap door	2, 3, 5, 6, 8, 11, 17, 23, 24, 25, 27
Closed trap door	2, 3, 5, 6, 8, 11, 17, 18, 23, 24, 25
Moved pirate on ship towards the back of the ship, using the stairs	5
Tilted ship	5, 9, 13, 15-17, 19, 25
Moved the ship into an upright position	13
Placed parts of the ship back on that fell off	5, 8, 18
Moved front sail	7
Stood pirate on the front cannon	8
Stood up pirate that fell over in play	8
Placed pirate at front of ship (while ship was tilted) and released him	9, 15, 19
Climbed a pirate onto the ship	14
Moved pirate along the stairs	14, 15, 16
Removed pirate from look out	16
Walked a pirate around a group of other pirates	18
Removed flags from the ship	22
Shot cannon ball in the air with his hand	25
Sat small cannon on the trap door	27

Appendix DD

Table 51 (in entirety). Eli's unscripted verbalizations for the pirate play set

Unscripted Verbalizations	***Session(s)***
"Want to do a treasure…have a pirate."	1
"Joseph and I'm on the pirate."	1
"Like Joseph and the pirate."	1
"Where's treasure, it's missing."	1
"Okay."	2
"Fire."	2, 4
"Excuse me, the pirate ship."	4
"Good I can open the…you're back."	5
"Now open."	5
"Going back in the ship, okay bye-bye, jump."	5
"Look out…look out!"	5
"Not that one, he's up here."	5
"Handle my pirate man."	5
"Oh."	5
"Come on guys."	5
"Oh shoot, my flags."	5
"I want…trust me I'm protecting you."	5
"I will protect you."	5
"Leave them on the boat."	5
"Want these and this one."	8
"No."	8
"Start this boat."	8
"They um, just broke."	8
"I like Titanic."	8
"Oh, let's see."	9
"Captain, Captain, come out here."	9
"Some boat."	10
"I want ship…get some ship."	10
"Zac, want it, this one."	10
"Oops."	10
"Let's go back…let's go back here…back, back."	11
"Whoa, that's good."	11
"Common let's go back here."	11
"Jump and go."	11
"Need some pirate ship."	11
"Back to the back of the ship."	11
"Coming, coming, coming off."	11
"Whee!"	13
"Let's go back in."	13
"Excuse me, this um, this one."	13
"This one, want some pirate ship."	14
"Some pirate ship, Eli some pirate ship."	14
"Look Titanic."	14
"Let's go back."	14

“That’s cool!”	14
“Digging.”	15
“I am the captain.”	15
“Oy, in.”	16
“Can some this one.”	17
“What yellow flag is.”	18
“Can have some pirate ship?”	18
“Watch out, the ship is totally broken.”	20
“Dangerous pirate.”	20
“Dangerous pirate, broken pirate.”	20
“Want take off the flags.”	21
“Titanic broken.”	21
“Must be something.”	21
“Crown.”	21
“Walking.”	21
“Broken, broken.”	22
“I play pirate no more…play pirate ship anymore....is broken.”	22
“Watch out for flags…oh no, it’s going up in the flags…look, now it’s not being flag.”	22
“Oh no…oh no…oh no…oh no…oh no…stop no.”	22
“Oop, look.”	23
“On trap.”	23
“The other flag.”	24
“No not that.”	24
“And this, want this one.”	24
“Some this one.”	24
“Some this one, on here.”	24
“Come on, let’s go…come on, let’s go.”	25
“Look out!”	25
“Fire, fire, fire!”	25, 26
“Pirate ship.”	26
“This one, pirate ship.”	26
“Want some pirate ship.”	26
“Some this one.”	27
“Excuse me Zac.”	27
“Excuse me, want some pirate ship.”	27
“We’re on the ship.”	29

Appendix EE

Table 54 (in entirety). Zac's unscripted play actions for the knights and castle play set

Unscripted Play Actions	***Session(s)***
Shot small cannon at another object (knight, castle, window, other cannon, or castle doors)	6, 7, 9, 13, 19, 24, 26
Shot big cannon at another object (knight, castle, window, other cannon or castle doors)	20, 26
Pushed on catapult to shoot it (with a different object in it such as the small cannon ball or a knight)	1, 9, 25
Shot catapult that was empty	29
Placed small cannon on the roof of the castle	6, 15
Placed small cannon through door opening	15
Placed small cannon ball in catapult to shoot it	1
Placed small cannon inside big cannon to shoot it	17
Placed small cannon ball in catapult to shoot it	25
Placed a knight in the catapult to shoot it	1, 2, 9
Placed a ball in front of small cannon and shot it in the air by hand	17
Moved weapon of a knight	1, 2, 7, 10, 13, 14
Stood knight in front of the catapult along the edge of the roof	1
Placed a knight on the castle	1, 2, 10, 14, 21, 22, 25
Stood knight on ledge of the roof	10, 15
Placed knight along edge, hanging upside down	12, 24, 25, 27
Moved knight along the edge of the castle	2
Flew a knight onto the roof of the castle	4, 12, 13
Flew a knight off of the castle	2, 4, 5, 10
Flew a knight into the air	6, 9, 12, 16, 25, 29
Hit knight onto the table	2, 29
Animated knight while holding him	22, 23, 25
Opened side drawbridge	2, 27
Tried to put catapult ball through a door (front door or roof door)	2, 6, 15, 19, 23, 24
Put catapult ball into the castle	6, 20
Flew a ball (small cannon, big cannon, or catapult) into the air saying "phph"	4, 6, 7, 19, 25, 29
Moved a ball by hand to hit a knight	24
Opened the roof door	6, 18
Closed the roof door	2, 6, 18
Hit knight against the drawbridge	5
Tried to put knight through a window	5
Crashed two knights together	5, 10, 12, 15, 16, 18, 22, 25
Used one knight to chase another knight	5
Moved the castle from side to side (while saying 'phph' as if was under fire)	6
Moved the castle onto a side (while saying 'phph')	19

Removed flags from the castle	9
Moved a knight to approach another knight	9, 10, 21, 26
Put a knight into the castle through the drawbridge	10
Put a knight through a door opening	15
Stood a knight behind cannon (big or small)	17
Raised both of his arms as if in victory	20
Pulled ladder through the front doors	21
Leaned ladder against the front of the castle	21, 22, 24, 25, 27, 29
Leaned ladder against the back of the castle	29
Hit a knight against the front doors	21
Hit ladder over the castle	22
Put a knight through the side drawbridge	25
Walked a knight on the roof of the castle	25
Brought a knight onto the roof through the roof door	25
Handed a knight to a peer	26
Pulled on walls and sides of the castle to destroy it	26
Opened the front doors	27

Appendix FF

Table 55 (in entirety). Zac's unscripted verbalizations for the knights and castle play set

Unscripted Verbalizations	***Session(s)***
"Fire."	1, 2, 4-6, 9, 13, 17, 24, 25, 29
"Phph." (a firing sound)	1, 2, 4-7, 9, 10, 12-15, 23-25, 27, 29
"Oh, a guard fell off…a guard fell…look a guard fell off…I said a guard fell off."	1
"He's going to keep an eye."	1
"What do you do with this?"	1
"Whoa, let's do."	1
"Watch, let's do them both."	1
"Oh neat."	1
"Reload."	1
"Oh, we need more power."	1
"Why?"	1
"It went over the castle and shoots over the table."	1
"Hey last one."	1
"Give 'em back, my ball!"	2
"Come on."	2
"I need you…to check on it…don't fall."	2
"I need to go, ahhhh."	2
"Jah, ahhhh, attack."	2
"Enemies splat."	2
"Fire him off…lights out big fella."	2
"Whoa…ah, he's dead."	2
"Kachung, there's too much fire around."	2
"Come on, give up…us want us…gets us man."	2
"Phph, hey you phah."	2
"He slided."	2
"Yeah men."	2
"He swung…why did he, did you swung him…why'd you swung him?"	4
"That's what you get."	4
"That's supposed to happen."	4
"I thought I just killed you."	4
"I know."	4
"This is not supposed to."	4
"I hold that."	6
"Well, well how, ah got to share."	6
"Ah, okay, I will."	6
"That was not supposed to happen!"	7
"Why does he always get this…and not me…and I always get stuck with this one?"	7
"Can you share with me…can we s…can you have that…and I have that? Let's just swap."	7

“Won’t this fires?”	7
“This is in that…let’s try and do it in this…you need something...yeah, watch.”	7
“What is this fires turns?”	7
“Let’s see which one fires the most.”	7
“Now let’s see which one fires too much.”	7
“Right…let’s do it…are we ready…let’s go.”	7
“Well, that fired the most then.”	7
“Okay, both of them on the wall. I want to fire and shoot at something.”	7
“Cool, watch, watch, watch this.”	7
“Watch this…watch Miss.”	7
“Oh, whoa.”	9
“Take the flags off.”	9
“You can be useful.”	9
“It’s hard to get to the top.”	9
“We need to destroy the black ones.”	9
“Let’s make him die.”	9
“Oh, you can’t fire.”	9
“Put him in.”	9
“Do it.”	9
“How is he dead?”	9
“Okay, you can shoot the man.”	9
“Poor man.”	9
“Man, white man’s coming.”	10
“You said we could walk on this.”	10
“Okay, the enemies fell down.”	10
“Get out of my life.”	12
“Die.”	12
“Enjoy the floor, you…”	12
“Guard sir, don’t have no more bullets.”	13
“It’s going to fall.”	13
“Which one are you being?”	14
“Oh, okay, I guess I’ll be just them two then.”	14
“I’ll do that.”	15
“We need a ball…give me a ball.”	15
“We need a ball up in.”	15
“Oh, it’s stuck.”	15
“Ahh, man in hole.”	15
“Zac, how dare you kill my friend…I’m going here to save you.”	15
“I’m killing him.”	15
“You think you’re comin’…you’re wrong boy…what’s a matter with you…are you hurt or something…no I’m not hurt or something…so you’re just like a___.”	16
“He tricked me.”	16
“Won’t work.”	17
“My fault didn’t work.”	17
“Hey, I was having that.”	17
“Why are you firing him?”	17

“Ready and fire him.”	17
“It’s not what supposed do with it stupid Eli.”	17
“Okay, I got it.”	17
“Wow, look at this.”	17
“Won’t fit in…fittin in.”	17
“Arggh, phph.”	18
“Huah, he’s dead.”	18
“Where are they going?”	18
“Ready…well if you’re ready or not…ready and fire.”	18
“Load cannons.”	19
“Where is the trumpet?”	19
“Why’s castle falling?...castle’s falling!”	19
“Why did we not…so we’re not taking the castle apart…right, we’re doing the just sitting here.”	19
“Ah, I lost my the rest of my.”	19
“Ow, my face!”	19
“Yeah, it just fired in my face.”	19
“Why is it not even fire?”	20
“I didn’t.”	20
“Where’s the ball…give us the ball k…give us the ball…stolen ball.”	20
“Cool!”	20
“So where I supposed to shoot it?”	20
“Ready…ready…ready and…and fire.”	20
“Gone.”	20
“That was cool!”	20
“That was, now that was awesome!”	20
“Put that back in.”	20
“Load cannons.”	20, 21
“Not supposed to get back in.”	20
“What you doin?”	21
“Ready and fire the ladder.”	21
“Come out…we left some men…uh uh…let us out.”	21
“No I’m the k…we are the king of the castles.”	21
“Well let’s see what all you got ya.”	21
“Do do do do.” (making sound as his knight approaches another knight)	21
“Here do do do do.”	21
“Why,,,why are…why…why is this white (holding up white knight) and why are these blacks, eh?”	21
“Up the ladder…up me the ladder.”	21
“Yeah, I’ll be him.”	22
“Leon, this is…whose he? Is he Leon?”	22
“You’re the enemy, that’s why.”	22
“Hey, he’s supposed to be.”	22
“What’s happening to him, uh…?”	22
“Destroy the ladder.”	22
“No it doesn’t…go out of the castle.”	22
“What did you put in?”	22
“Oh, it’s a toy cannon…it’s a cannon.”	22
“Load my cannons.”	23

“Hey, it doesn’t work.”	23
“Fire, boom, boom, boom, boom.”	23
“I did it soft.”	23
“It’s broken.”	23
“Uh, it’s the same colour…look, they’re the same colour.”	23
“Now it’s not even…it’s broken.”	24
“Hey I got an idea Eli…Eli I just got an idea.”	24
“Awe, it doesn’t even fire.”	25
“I’m inside…I’m inside the top of the castle.”	25
“The ball…I need the ball…I need the ball Eli.”	26
“You be that guy.”	26
“Destroy the castle.”	26
“Stop it, I can’t fire it.”	26
“Well, well you just said destroy the castle.”	26
“No, brown button and go.”	26
“Come on, let’s get them.”	26
“Load our cannon.”	27
“Hey…where’s the ladder?”	27
“Open the doors.”	27
“Aah, help!”	27

Appendix GG

Table 58 (in entirety). Eli's unscripted play actions for the knights and castle play set

Unscripted Play Actions	***Session(s)***
Opened roof door of the castle	1, 4-7
Closed roof door of the castle	1, 3, 6, 17, 27
Opened front doors of the castle	2-8, 10-12, 14, 17-19, 22-24, 26, 29
Opened side drawbridge	2, 4-8, 10, 11, 13, 14, 17, 19, 22-24
Put his hands through front doors to open side drawbridges (from inside the castle)	1
Shot small cannon at another object (knight, castle, window, other cannon, or castle doors)	3, 4, 5, 7, 11, 12, 21
Shot big cannon at another object (knight, castle, window, other cannon or castle doors)	7
Tried to shoot the big cannon with a different object in it (such as the small cannon ball or a knight)	1
Tried to shoot the catapult with a different object in it (such as the small cannon ball or a knight)	25
Flew a ball (small cannon, big cannon, or catapult) into the air	1, 15
Placed the knight in the big cannon to shoot it	1
Placed small cannon ball in the big cannon to shoot it	1
Placed small cannon ball in the catapult to shoot it	25
Leaned ladder against the front of the castle	2, 7, 8, 10, 12, 14, 17, 18, 20
Put knight through roof door to go downstairs	2, 6
Put a knight through the front doors	3
Placed flags in different locations on the castle	3
Turned the castle around to face him/or closer to him	5, 13, 19, 21
Hit small cannon ball on the castle	5
Walked a knight down the ladder	8
Moved flag stand to the right of the castle	10
Reattached door	13
Leaned forward and looked through front doors	14
Pushed a ball through the front doors of the castle	18, 19, 26
Threw ball by hand towards the front doors	26
Took big cannon from peer	24
Took small cannon ball from a peer	25
Moved big cannon on to the table	25
Placed small cannon inside the front doors, facing outwards	29

Appendix HH

Table 59 (in entirety). Eli's unscripted verbalizations for the knights and castle play set

Unscripted Verbalizations	***Session(s)***
"Fire."	4, 5, 11, 21, 24
"Yes."	1
"Let them outside."	1
"Whee!"	1
"He's missed um one."	3
"Get the flag, the flags…flags."	3
"Fags, flags, flags, this is for flags."	3
"Uh oh, watch this, falling flags."	3
"Need some castle, not some ball."	4
"Come on you not give to me."	4
"Give it to me!"	4
"No!"	4
"Whoa, fire!"	5
"We'll be lying downstairs, downstairs, downstairs, downstairs."	5
"No this way."	5
"Okay, want to turn it please."	5
"Load and fire."	5
"Oh no, doors shut."	5
"Flag stand stays here."	10
"No, not in your castle Eli."	13
"Oh door."	13
"And fire."	15, 21, 24
"Trumpet."	16
"Excuse me boy…boy…boy…play trumpet…trumpet."	16
"Um, excuse me boy…boy what ya doing?"	16
"Need some trumpet…that boy."	16
"Boy some trumpet."	16
"Um trumpet, trumpet."	16
"Excuse me …excuse me…Sean…Sean, Leon…what you doing?...come on…excuse me…some trumpet."	18
"Come on."	18
"Excuse me, what are you doing?"	19
"Excuse me, help with my trumpet."	19
"Some castle please."	19
"Excuse me."	19, 25
"Excuse me…some trumpet…sound the trumpet…excuse me Sean…excuse me…sound the trumpet."	21
"Cannon."	21
"Some castle."	21
"Count."	21
"Check your knights."	22
"Excuse me…excuse me…excuse me…Sean	22

there…what are you doing?...sound the trumpet."	
"Load ____ cannons."	23
"Guys."	24
"Eli's turn."	24, 26
"Well guys, trumpet…some trumpets…"	25
"Load the cannons."	25
"Excuse me guys, sound."	26
"Some this one."	26
"Give back to me…give back to me now!"	26
"Press red button and go."	26
"Excuse me guys." (sound the trumpet)	27
"You our cannon."	27
"____ bridges."	27
"Load the cannons."	29
"John, Lee…"	29

Appendix II

Table 61 (in entirety). Zac's verbalizations for the space play set

Zac's Verbalizations	***Session(s)***
"Phh."	1, 2, 5, 6, 7, 13, 17, 18, 19, 20, 22, 25
"You made it all work but I don't care if."	1
"Why does everyone no want to play with me cause no one plays with me."	1
"I'm gonna sua knock down."	1
"Down oh-ya knock down."	1
"I'm going to take off now."	1
"I can have a ship. Can I borrow your ship Eli?"	1
"Right let's."	1
"Moon spinnin around."	1
"That wasn't supposed to happen."	1
"Oh not again oh no."	1
"I'm gonna shoot you with my gun."	1
"Putchew."	1
"Why is he not even shooting?"	1
"At the ship. Phh."	1
"Moon spinning."	1
"Spinnin and spinnin and spinnin."	1
"Let me out!"	1
"Where's Mars like?"	1
"Is that Mars?"	1
"What's that called?"	1, 2
"What?"	1, 2, 7, 19
"Maybe it's a moon rock."	1
"You want power come back and fight like a man."	2
"Not good enough Shellington."	2
"Coming for you."	2
"Hey you, phh, phh."	2
"Phh ahh."	2
"Whoah, they fly."	2
"Like yeah, you done now."	2
"Look not so nice huh?"	2
"What happened? What happened to his gun?"	2
"Oh no!"	4
"Put it in the bin, it's broken."	4
"Let's go to the moon."	4
"We left the men on the moon." (says phrase four times)	4
"We left your man there."	5
"What is this supposed to be?"	5
"No, I mean that."	5
"Ow, my eyes on fire!"	5

“Get out.”	5
“That a very tiny flag.”	5
“What do you do with the flag?” (said three times)	5
“What you supposed to do with the flag?” (twice)	5
“Why is it not even still on?”	5
“There did it.”	5
“Aw, not again.”	5
“Phew. Puah.”	6
“Why?”	6, 13, 17, 18, 26
“Aah. Phh.”	6
“Ow. Phh. Phh.”	6
“Ooh attack!”	6
“On your marks, get set, fork it.”	6
“What, what’s in there?”	6
“What’s that?”	6
“Where does this sign go? There?”	7
“This stays here forever.”	7
“Don’t you want this?”	7
“Ah phh.”	7
“We left men on the moon.”	7
“Yeah, stop laughing at me.”	7
“What now ____ get on the moon please so quick aah.”	7
“Don’t need any more.”	7
“What’s going on?”	7
“Let’s go okay?”	7
“Now that’s what I’m going to the moon.”	7
“Hey what you guys doing?”	7
“What’s so funny?”	7
“He’s not.”	9
“How I don’t see him on any space ship?”	9
“How?”	9
“Where’s Eli?”	9
“I am an astronaut.”	9
“Woah!”	9
“Aw sorry.”	9
“Blast off.”	9
“We’re in space.”	9
“Wop aah.”	10
“Do you wanna play a moon rock?”	10
“What are ya supposed to do with the moon rock?”	10
“What’s this for?”	10
“Why did you not get the water?”	10
“Ah!”	12
“I was.”	12
“The moon’s allowed to spin.”	12
“Huh, we dropped a bomb.”	12
“Quick before the bomb.”	12
“You’re not a level 2 with it, it’s just a moon rock.”	12
“Just a moon rock.”	12
“Yeah I am.”	12

“Oh no, they were like ____ make water with them.”	12
“Hey put him in there. You can’t. You can put him on.”	13
“Why is he not even doing it?”	13
“Why can he not get on?”	13
“Puaw, do, do, do, do, do.”	13
“Why’s the moon?”	13
“There’s no Mars. There’s no Mars there.”	13
“You suck.”	13
“How can you play with a moon rock? How do you play with the moon rock? How do you play with the moon rock?”	13
“Eh? How do you play with a moon rock?”	13
“Where’s the flag. Where’s the flag?”	14
“You can’t put it on. You’re not allowed to put the flag on.”	14
“No!”	14
“Get them off!”	14
“What are these supposed to do for?”	14
“You can pretend. You can pretend.”	14
“Know that the astronauts not go in the rocket.”	14
“Have to pretend. Why do you have to pretend?”	14
“You can’t.”	14
“So ya hide them. Where?”	14
“Where’s your boys?”	14
“Space time. Space time.”	14
“What are you two doing here?”	14
“Okay.”	14
“Bye.”	14
“Hand me the rocket.”	15
“Oh man.”	15
“You gotta put him on the rocket. Inside the rocket.”	15
“Why can’t it go in the rocket? You’ve got to pretend.”	15
“Sh this flag.”	15
“You can’t. You can’t fool me.”	15
“Look, look at that. Look at that.”	15
“Schow.” (hitting astronauts together)	15
“Well how are you astronaut?	16
“Well I’m fine moon rock.”	16
“What I don’t care.”	16
“Aw.”	16
“Well I don’t care ____ astronaut. Whoever you are.”	16
“Om wha.” (hitting astronaut and moon rock)	16
“You made us crash…crash…ahh!”	16
“Get off man!”	16
“You’re allowed to have two.”	16
“I have ones look.”	16
“There you go. You can have him.”	16
“Whee, du, du, du, du.” (like a jingle - flying shuttle)	16
“Sy du, du, du, du, du, du.” (jingle while flying	16

shuttle)	
“Whee ah…woo hoo…yeah yeah…phh…come on, yeah ah.”	16
“Yeah, we’re flying…yeah.”	16
“We are not on the moon yet.”	16
“Wah. Help I’m stuck. Help me. Help.”	16
“Ah astronaut, ah phh.”	16
“Ah, I’m on the wing.”	16
“Ha I want to be the two astronauts. I just don’t want to be ____.”	16
“This is in the middle. The moon.”	16
“Wah.”	16
“Bye. Help me up. Help me get up. Help me up.”	16
“Hey, I thought that goes on. I thought that goes.”	17
“Ah…ah.”	17
“He’s not, he’s not riding it any more. No.”	17
“We haven’t got enough camera for it.”	17
“Hey, you forgot our men.”	17
“Ah, he’s dead cause you left him there.”	17
“Whew, phh.”	17
“Woah.”	17
“Help help”	17
“Ah, what.”	17
“Why do we need to leave it?”	17
“I’ll take the rocket.”	17
“Put this. Well why don’t you…can’t you put them in?”	17
“What? You’ve got to pretend.”	17
“What’s inside that rocket?”	17
“Maybe it’s the.”	17
“No mouth.”	17
“Fly…phh.”	17
“Airplane rocket ran out.”	17
“Ooh.”	17
“That’s not right. Did he just copy something?”	17
“Why can he still not sit?”	18
“Why is this stuck on? Why is stuck on them? Why is it stuck on them?”	18
“Can you put him inside?”	18
“Whee…ha…ooh hoo!”	18
“Hey, put that out of the moon.”	18
“What’s this supposed to do?”	18
“What are yous doin?”	18
“What yous doing on the moon here?”	18
“I did it.”	18
“Yeah, and the thief got out with the moon.”	18
“Whys? How do you have to take the moon rock home?”	18
“Why he can’t fit?”	19
“Ooh.”	19
“Right here. The rocket wins. Right here.”	19

“Excuse me, what’s this called?”	19
“Wah.”	19
“Ha, ha, ha, ha, ha.”	19
“Why don’t use the cannon with astronaut and space?”	19
“Why don’t want a cannon?”	19
“Cause you can ____ somebody.”	19
“Ready and fire.”	19
“Ready aim fire.”	19
“Don’t spit on it.”	19
“Hit it, lick it, hit it, lick it.”	19
“Let’s go back to the hide out John.”	19
“Someone’s comin, ready aim fire.”	19
“Let me have that one.”	19
“Let’s play space.”	20
“Woo woo.”	20
“Aah phh.”	20
“Woah!”	20
“Agh, woah. Bye bye astronaut.”	20
“That was cool.”	20
“That’s not ____.”	20
“No, I’ve been aw but I didn’t want only one astronaut.”	20
“Two.”	20
“You should have found…and we…if you can ____.”	21
“Help me, help. Ah, I’m fallin. Help me.”	21
“Do you know what… Where’s the black thing that goes…?”	21
“Hey, here. Do you want to take a moon rock home?”	21
“We’re playing space and then knights.”	21
“Then computer.”	21
“I thought that stays on earth.”	21
“Aw.”	22
“Hey, why’d?”	22
“How we’ve got one missing?”	22
“Look!”	22
“Hey. No, no thank you.”	22
“Phh phh ahh ahh.”	22
“Woop ahh.”	22
“Okay.”	22
“What’s oh no, the moon’s spinning around.”	22
“Oh, it’s coming off.”	22
“Ow, that hurt my head. Wah, wah.”	22
“Yeah.”	22
“Come on men.”	22
“Pshew.”	22
“What’s so funny?”	22
“I know that.”	22
“ ____ mateys.”	23
“No thank you.”	23
“Hey you want to go to the moon?”	23

“Sh…aw…here.”	23
“Well, which one do ya?”	23
“Well here.”	23
“Pshew.”	23
“Woah…phh…augh.”	23
“ ____ up the blue bird.”	23
“Where’s the flag thing?”	23
“Where’s, where’s the signs?”	23
“Eli, stop mucking about.”	23
“Stop it Eli. You’re ruinin, you’re ruining everything.”	23
“Well here.”	23
“Well that, that looks ____.”	23
“Where’d you get that noise from?”	23
“Stop it.”	23
“John it was me. John it was me.”	24
“John it was me.”	24
“Aw, now I have no astronauts to play with.”	24
“Here.”	24
“What fell under there?”	24
“What yas doing to the moon?”	24
“I, I will have the moon rock.”	24
“What do you want?”	24
“I’m done.”	24
“Hey.”	25
“Well that’s. This fair.”	25
“Woah…woah…woah.”	25
“Where’s, where’s the other?”	25
“Oh, yeah man.”	25
“What happened to him?”	25
“Hey, stop it.”	25
“Flag.”	25
“You stuck. You stuck a man there.”	25
“You can’t get him off.”	25
“Okay, I’ll be the thin piece.”	26
“Let’s play space, okay?”	26
“Sound the trumpet.”	26
Trumpet sound.	26
“I want ba ba ba ba.”	26
“I’ll be that one.”	26
“Help. Someone call help.”	26
“Phew.”	26
“Stop laughin. It’s not even funny Eli.”	26
“Stop giggling.”	26
“I hate it when he does like that.”	26
“Fine, you can be him.”	26
“___ on my count, ready aim fire.”	26
“Hi guys look what’s in my teeth.”	26
“Do do do do.”	26
“Aw we’re two tie up. Phh.”	26
“Come on Corgy, come on.”	26

“Come on. Ahh. Phew.”	26
“Or this side. Phh.”	26
“Or this. Drop off. Okay. Phh. Aah. Help us a parcel. Ahh.”	26
“Where’s the one in the chair?”	27
“There’s one missing. The one in the chair.”	27
“We used to have 4 and now we lost one.”	27
“Who lost it?”	27
“Is it there yet?”	27
“No I’m not.”	27
“You can see it on the chair or on the floor, so I’m not hiding it.”	27
“What? I know. I’m not.”	27
“I’m not. Not me. Not me.”	27
“Is it on the floor?”	27
“So that’s it. We lost it now.”	27
“Hey, wanta go to the moon?”	27
“Okay. I’m on.”	27
“Where’s Mars? Where’s Mars? Mars missing as well?”	27
“Hmm Hmm”	27
“Oh ____”	28
“____ on the moon.”	28
“Is that a real moon? Is that a real one? Is that a real one?”	28
“What youse two doing in the moon?”	28
“Is that Mars? Is that Mars? Is that Mars?”	28
“Then where’s the Mars uh?	28
“Why?”	28
“You gotta pretend its Mars.”	28
“Guard your stations.”	28
“Uh, this is upside down going onto Mars.”	28
“I’m on Mars. On Mars. Ooh Mars.”	28
“I’m going looking on Mars. I’m looking on Mars. I’m returning to the spaceship Mars.”	28
“Ahh, Phh.”	28
“Where’s, why you saying Jupiter?”	28
“You are there as well.”	28
“It’s raining out there.”	28
“Phew.”	28

Appendix JJ

Table 62 (in entirety). Eli's verbalizations for the space play set

Eli's Verbalizations	***Session(s)***
"____ video game."	1
"Phh."	1, 7, 8
"Rocket."	1
"The V ship."	1
"Whoah ____! "	1
"____ guys, play space."	1
"Ah space."	1
"Here rocket."	1
"The rock."	1
"Shhh." (flying sound)	2
"Playing airport and space to the moon."	2
"Aah, aah."	3
"Watch, watch, watch it!"	3
"Watch, watch, watch!"	3
"Here we go, here we going on a ____."	4
"I'm gonna do."	5
"Spider."	6, 20
"Look the spider."	6
"It's a spider."	6
"Phew."	7, 12, 14, 15
"That spider, spider."	8
"Some plane."	8
"Aah."	8
"You left without me." (twice)	9
"Spider, spiderman, spiderman."	9
"Excuse me, the plane."	10
"Have a spider."	11
"Want some plane, want some plane please. Want some plane."	11
"Yeah."	11
"Aah, wa."	12
"Come on."	12
"Year un." (flying sound)	14
"Yes."	14
"Yulp." (pretending to eat something)	15
"Aw."	16
"Two three."	16
"Have some three mans. Three mans."	16
"Three mans."	16
"Not this one. This one."	16
"USA not this one."	17
"Took off space."	17
"Oh, s_ _ _."	17
"Yearoon." (flying shuttle)	17
"Ooh ooh."	18

“Excuse me.”	18
“Pardon.”	18
“Not.”	19
“No!”	19
“Excuse me.”	19
“Excuse me two. Some two please.”	20
“Zac some two.”	20
“Some share please.”	20
“Ugh. I’m stuck look.”	21
“Ugh.”	21
“And then play knights.”	21
Sounds trumpet.	21, 22
“Why.”	21
“Ada ado ado ada.” (jingle)	21
“I like when do Halloween and the castles.”	21
“Shickdress…shifdress.”	22
“I know I like treasure. Sound the trumpet.”	22
“Woah, woah, woah.”	22
“No this. Some this one.”	23
“N want this one.”	23
“Not this one. N this one.”	23
“This one.”	23
“Some this one.”	23
“No, no ooh.”	24
“Excuse me Zac un this one.”	24
“Want space.”	24
“Want this, this one.”	24
“Not this one. Give me this one.”	24
“Oh, oh my _ _ _.”	24
“That ones, no this one.”	25
“Ha ha ha ha.”	25
“Uh uh.”	25
“Okay.”	26
“Ahh.”	26
“Rock.”	27
“Shew.” (flying shuttle)	27

Appendix KK

Social Skills Checklist Pre- and Post-Intervention Results for School #2*

	Pre-Intervention				Post-Intervention			
Does the child…	**Almost Always**	**Often**	**Sometimes**	**Almost Never**	**Almost Always**	**Often**	**Sometimes**	**Almost Never**
1.1 Beginning Play Behaviors								
f. Maintain proximity to peers within 1 foot.	3				2	1		
g. Observe peers in play vicinity within 3 feet.	2	1				2	1	
h. Parallel play near peers using the same or similar materials.	1	2			1	2		
i. Imitate peer (physical or verbal)		1	2		1	2		
j. Take turns during simple games.	2	1				1	1	1
1.2 Intermediate Play Behaviors								
h. Plays associatively with other children.		1	2				1	2
i. Respond to interactions from peers.		2	1			2	1	
j. Return and initiate greetings with peers.	2		1				3	
k. Know acceptable ways of joining in an activity with peers.				3				3
l. Invites others to play.				3		3		
m. Takes turns during structured games/activities.	2	1				3		
n. Ask peers for toys, food and materials.				3		1	1	1
1.3 Advanced Play Behavior								
h. Play cooperatively with peers.				3				3
i. Make comments to peers about what he/she is playing.	1	2					2	1
j. Organize play by suggesting play plan.			1	2				3
k. Follow another peer's play ideas.		1	2			1	2	
l. Take turns during unstructured activities.		3				1	1	1
m. Give up toys, food and materials to peers.		2	1		1		1	1
n. Offer toys, food and materials to peers.		1		2				3
2.1 Understanding Emotions								
k. Identify likes and dislikes	3				1	1		1
l. Label and identify emotions in self.	2			1		2	1	
m. Label and identify emotions in others.	1	1		1	1	1	1	

n. Justify an emotion once identified/labelled.	2		1		1		1	1
o. Demonstrate affection toward peers.	1		2		1	2		
p. Demonstrate empathy toward peers.				3		1	2	
q. Demonstrate aggressive behaviour toward others.			1	2			1	2
r. Demonstrate aggressive behaviour toward self.			2	1			2	1
s. Demonstrate intense fears.			2	1			1	2
t. Uses tone of voice to convey a message.		2		1		2	1	
2.2 Self Regulation								
m. Allow others to comfort him/her if upset or agitated.	2		1		2		1	
n. Self regulate when tense or upset.	1	1		1			2	1
o. Self regulate when energy level is high or low.	1	1		1			1	2
p. Use acceptable ways to express anger or frustration.	1		1	1			1	2
q. Deals with being teased in acceptable ways.	1		1	1	1		2	
r. Deals with being left out of a group.	2			1	3			
s. Requests a 'break' or to be 'all done' when upset.			1	2			1	2
t. Accepts not being first at a game or activity.	2	1			2			1
u. Says 'no' in an acceptable way to do things he/she doesn't want to do.	1	1	1		1	1	1	
v. Accepts being told 'No' without becoming upset/angry.	2		1		2		1	
w. Deals with winning appropriately.	2			1	2	1		
x. Accepts losing at a game without becoming upset/angry.	2			1	2			1
2.3 Flexibility								
g. Accepts making mistakes without becoming angry/upset.	2			1	1	1		1
h. Accepts consequences of his/her behaviours without becoming upset/angry.	2		1		1	1	1	
i. Ignore others or situations when it is desirable to do so.	1		2		1		1	
j. Accepts unexpected changes.	2	1			2			
k. Accepts unexpected changes (different qualifier).	2	1			2			
l. Continue to try when something is difficult.	2			1	1		1	
2.4 Problem Solving								
e. Claim and defend possessions.	1	1	1		2	1		
f. Identify/define problems.		1	1	1				3
g. Generate solutions.			2	1			1	2
h. Carry out solutions by negotiating or compromising.			1	2				3

3.2 Participate in Group									
d. Seek assistance from adults.	1	1	1		2		1		
e. Seek assistance from peers.				3				2	
f. Give assistance to peers.			1	2			1	1	
3.2 Participate in Group									
d. Respond/participate when one other child is present.		1	2		1	1	1		
e. Respond/participate when more than one other child is present.			2	1	1	1		1	
f. Use appropriate attention seeking behaviours.	2	1			1	1		1	
3.3 Follow Group									
f. Remain with group.	2				2		1		
g. Follow the group routine.	2				2		1		
h. Follow directions.	1	2				1	1	1	
i. Make transition to next activity when directed.	2				2		1		
j. Accept interruptions/unexpected change.	2				2			1	
4.1 Conversational Skills									
k. Initiate a conversation around specified topics.				3			1	2	
l. Initiate conversations when it is appropriate to do so.				2			1	2	
m. Ask "Wh" questions for information.		2	1		1	1	1		
n. Respond to "Wh" questions.	2		1			2	1		
o. Respond appropriately to changes in topic.		1	1	1		1	2		
p. Make a variety of comments, related to the topic, during conversations.		1	1	1			1	2	
q. Ask questions to gain more information.		1	1	1		2	1		
r. Introduce him/herself to someone new.	2			1		2		1	
s. Introduce people to each other.				2				3	
t. Demonstrate the differences between telling information and asking for more information.		1		1				3	
4.2 Nonverbal Conversational Skills									
i. Maintain appropriate proximity to conversation partner.	2				2		1		
j. Orient body to speaker			2				3		
k. Maintain appropriate eye contact.		1	1				3		
l. Use an appropriate voice volume.	1		1		1	1	1		
m. Pay attention to a person's nonverbal language and understand what is being communicated.	1	1			2		1		
n. Wait to interject.		1	1			1		2	
o. Appropriately interject.				2				3	
p. End the conversation appropriately.				2		1	1	1	
4.3 Questions									

i. Answer "Yes/No" questions.	2	1				3			
j. Answer simple social questions (e.g., name, age, hair colour, address).	1	2				3			
k. Answer subjective questions.	1	2				2	1		
l. Respond to simple "Wh" questions.	2	1				2	1		
m. Ask questions to gain more information.			2	1		1		2	
n. Answer questions about past events.	1		2			1		2	
o. Stay on topic by making comments or asking questions related to the topic.			2	1				2	1
p. Use "Please" and "Thank you" at appropriate times.	1	1	1			1	2		
4.4 Compliments									
c. Give compliments to peers.			1	2				1	2
d. Appropriately receive compliments.				3					3

** Condensed the information to improve readability. Please see Appendix X for entire table*

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