# Teaching Social Skills to Children with Special Needs Using Video Modelling

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**Abstract**

Video modelling was used to teach 4 different social skills to four children aged between 6 and 10 years. Two of the children had formal diagnosis for autism spectrum disorder, one child had a formal diagnosis of attention deficit disorder and displayed traits of autism, and one child was currently being diagnosed and displayed traits of autism. The 4 different social skills were greeting and small talk, initiation and responding to conversation and play, initiation for conversation and play, and turn taking. The aim of this study was to build on the current literature on the efficacy and usability of video modelling for teaching social skills to children with autism. A single-subject, multiple baseline design was used. The overall results showed that video modelling was effective as a resource for teaching social skills to children with autism spectrum disorder and other deficits. Limitations and implications for future research are discussed at the end.

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# Introduction

## Autism

Autism spectrum disorder (ASD) is a neurodevelopmental disorder that presents as a deficit in social interactions, repetitive behaviour, restricted interests, and atypical sensory behaviour (American Psychiatric Association, 2013; McPartland, Law, & Dawson, 2016). Although ASD has a large spectrum, which means people's symptoms can differ in severity and manifestations, there are a few characteristics that are common among people with ASD. Social difficulties include verbal and non-verbal communication, difficulty following the rules of conversation, failing to initiate or respond to interactions with others, lack of emotion and facial expressions, or difficulty developing and maintaining friendships (Lord & Bishop, 2010). Repetitive behaviours and restricted interests often include repetitive body movements, phrases, sounds, rituals and other sensory seeking behaviours (Lord & Bishop, 2010). While these are just a few common traits of ASD, they in themselves vary largely.

There are a number of different conditions and diagnoses that are commonly associated with autism. Attention deficits and ADHD, intellectual disabilities, motor problems, global developmental delay, delayed speech development, and anxiety are among a few conditions (Simonoff et al., 2008). A diagnosis with a large overlap with autism, is intellectual disability (ID) (Matson & Shoemaker, 2009; Sturm, Fernell, & Gillberg. 2004). An estimated 40% of individuals with ID have ASD and 70% of individuals with ASD have ID (Autism Speaks, 2016; Matson & Shoemaker, 2009). Characteristics of individuals with autism as well as intellectual disabilities include social, cognitive and adaptive skill deficits as well as anxiety, depression, and self-injury. Matson and

Shoemaker (2009) identified a possible reason for such a high comorbidity between ASD and ID to be a similarity in the genetics of the two disorders. Another common diagnosis comorbid with autism is attention deficit disorders (ADD) (Smalley, 1997). As with intellectual disorders, attention deficit disorders and ASD have similar genetics components, which could be the reason for the disorders often being diagnosed comorbidly. Twin studies done on ADD and ASD are consistent with these results (Smalley, 1997).

Due to the spectrum on which autism can range, as well as the large number of comorbid conditions, individuals can often go undiagnosed, misdiagnosed, or the severity of their condition is not seen as being on the spectrum. Children are often not diagnosed until a later age, even though symptoms may be detected as early as 18 months (Centre of Disease Control and Prevention, 2016). This can sometimes mean that children do not get the proper care and treatment needed from an early age. In order for a child to be given a diagnosis they need to meet certain criteria, however there are many children who suffer from common autistic characteristics without fulfilling all the criteria (Autism Speaks, 2016).

Autism and autistic traits not only affect the individual with the disorder. There are many challenges that affect the health, social, and financial well-being of the family, school, and community involved with the person as well. It can be particularly stressful if a child or individual goes undiagnosed. In New Zealand, there seems to be an inconsistency in assessment and diagnosis, which can also be a major source of stress for the people involved (Autism summary guidelines, 2016). The cost of proper care and treatment is also a problem. It is estimated that the lifetime cost is $2.4 million for an individual with ASD and ID and $1.4

million for individuals who only have autism. The yearly cost in the US is around $236 billion a year for children and adults with autism (Autism Speaks, 2016). A large proportion of the costs go toward special education for the children and a loss of income for the parents, while residential care and lack of employment make up the majority of the costs for adults with autism (Autism speaks, 2016).

It is estimated that around 1 in 100 New Zealanders are on the autism spectrum and about 1 in 68 in the United States (Centre of Disease Control and Prevention, 2016; Ministry of Health, 2016). This is an increase from 1 in every 150 individuals in 2002, and if rates steadily increased over the 10-year study (Centre of Disease Control and Prevention, 2016). There is not enough information to determine rates have continued to rise over the last 4 years. Studies also showed that boys are more commonly diagnosed with autism, with 1 in every 48 boys being diagnosed with autism and 1 in every 189 girls being diagnosed (Centre of Disease Control and Prevention, 2016; Cheslack-Postava & Jordan-Young, 2012; Watkins, Zimmermann & Poling, 2014).

**Autism and Social Difficulties**

While children with autism have a diverse range of symptoms and characteristics, including repetitive behaviours, social difficulties, and challenging behaviours, it is important to focus on the effect that these behaviours have on the children's social lives. Regardless of cognitive and language ability, social deficits are a major impairment in a person's ability to function in the world. White, Keonig, and Scahill (2007) state that direct and indirect consequences of social deficits become more apparent as children get older and they become more aware of their differences to their typically developing peers. One such social difficulty is social cognition, which is the

ability to process and interpret socio-emotional information (White et al., 2007). Theory of Mind and the ability to attribute mental states such as beliefs, knowledge, thoughts, and points of view to oneself and others is an example of this social difficulty and studies have found that there is a high correlation between social cognition and the ability to function in social situations (Bishop-Fitzpatrick, Mazefsky, Eack, & Minshew, 2016; White et al., 2007). Fink, Begeer, Peterson, Slaughter, and de Rosnay (2015) found that when a battery of Theory of Mind tasks were completed by typically developing children with mutual friends, they did better than typically developing children without a mutual friend, demonstrating a correlation between social cognition and the quality of friendships.

While children with autism often prefer to be on their own, another social difficulty is the ability to develop and maintain friendships. There are many social rules around conversation, such as eye contact, turn taking, body language and facial expressions, understanding and showing emotion, and showing an interest in others. However, if these 'rules' are not followed, individuals with autism can be alienated from their peers. Bauminger and Kasari (2000) identified that individuals with ASD often felt lonely and desired more social interactions with peers. Social deficits can also have a direct impact on a child's mood, cause anxiety in situations they have found adverse in the past and hinder their ability to form meaningful relationships (White et al., 2007). Loneliness, anxiety and feelings of alienation can alter one's quality of life and isolate children with ASD even further.

Full inclusion and participation within the community can lessen the implications of social deficits. Inclusion in schools is a way for children with ASD

to learn, participate and belong. Children with ASD and other disabilities have the same right as typically developing children to attend and receive an education at a mainstream school within New Zealand (Ministry of Education, 2017). However, it is possible that children could be at an increased risk of bullying, peer rejection and social isolation (Chamberlain, Kasari & Rotherham-Fuller, 2007). It may also come at a larger cost and stress on the family and school to provide extra assistance in the classroom. One situation may not work for another, and each child and their needs must be taken into account. Ravet (2011) explored the perspectives of inclusive and exclusive education and stated that two perspectives need to be taken into account – 'rights-based' and 'needs-based'. Ensuring there is a balance between the child's right to living the least exclusive lifestyle and what is actually best for the child's well being is a challenge that needs to be dealt with individually.

**Applied Behaviour Analysis and Social skills**

The main principle of Applied Behaviour Analysis (ABA) is that behaviour is determined by its consequences (Roane, Fisher & Carr, 2016). Behaviours that produce favourable consequences will be more likely to occur again and those with less favourable outcomes will eventually decrease. Autism Speaks (2016) found that techniques used in ABA interventions have positively shaped communication, social skills, play, and other social skills for children with ASD. Due to ASD being such a varying disorder from one individual to the next, ABA intervention techniques range largely as well. Elliot, Sheridan, & Gresham (1989) stated that there are many effective methods for teaching social skills that include manipulation of antecedents, manipulation of consequences, model-based procedures and cognitive-behaviour procedures or cognitive behavioural

therapy (CBT).

Manipulation of the antecedent is changing the environment in order for the target social behaviours to occur. (Elliot et al., 1989; Gresham, 1981). An example of manipulating the antecedent could be getting a teacher to change their behaviour, such as abstaining attention during certain behaviour. A limitation to this method is the assumption that the individual is able to perform the target social skill at all (Elliot et al., 1989).

Manipulation of consequences could involve reinforcement when the appropriate behaviour is displayed or punishment when an undesired behaviour occurs (Gresham, 1981). For example, giving a child positive feedback when they put up their hand, instead of calling out, or reprimanding the child for calling out during class. This is a very effective method for increasing social skills, however, the method requires constant effort from the trainer (Gresham, 1981).

Cognitive behaviour therapy is a combination of modelling, prompts, coaching, role-play and self-instruction, self-monitoring and self-reinforcement (Elliot et al., 1989; Gresham, 1981). An example of cognitive behaviour therapy might be looking at what the underlying negative belief is behind an anxiety that a child might have toward a particular situation. The limitation to this technique is the use of less informative measures of reporting results, such as self-report (Gresham, 1981).

Modelling has three forms of intervention: symbolic modelling, live modelling, and participant modelling (Elliot et al., 1989). Modelling involves an individual observing the desired behaviour being performed in a natural setting. This could be video modelling or live observations of the desired behaviour. The issue with modelling is the requirement of others to constantly perform the

required behaviour (Gresham, 1981).

**Video Modelling and Social skills**

Video Modelling is an intervention where target behaviour is demonstrated to a participant using video (Bellini & Akullian, 2007; LeBlanc et al., 2003). The procedure involves a participant watching a video with the target behaviour being performed, followed by opportunities in which the participant can perform the target behaviour they have just observed (Anderson, Furlonger, Moore, Sullivan, & White, 2016). Video modelling is considered effective if the occurrence of the target behaviour increases (Nikopoulos & Keenan, 2004). In some studies, prompts and reinforcement can be paired with the video modelling to increase the occurrence of the desired behaviour (Anderson et al., 2016; LeBlanc et al., 2003). Bundura was the first to report on this topic in 1977 and he found that children learn most effectively through observing others (Bandura & Walters, 1977; Bellini & Akullian, 2007). He also found that children would perform regardless of setting, conditions and reinforcement but were more likely to imitate a model that was like themselves.

LeBlanc et al. (2003), Anderson et al. (2016), Qi and Lin (2012), and Bellini and Akullian (2007) are a just a few researchers who found video modelling to be an effective and promising method for increasing social skills in children with ASD. The effectiveness of video modelling was confirmed by Anderson et al. (2016) who suggested that video modelling increased the speed at which an individual acquired the target behaviour and that it produced generalisation across settings, people and conditions. Prompts and reinforcement paired with video modelling can be more effective than video modelling alone (Anderson et al., 2016). However, a recent study done by Wong

(2015), showed that video modelling without reinforcement and prompting was just as effective as studies that paired reinforcement with video modelling. The efficacy of video modelling could partly be due to technology being a popular and influential part of today's society (Anderson et al., 2016). It is also visually and audibly stimulating which minimises distraction and stimulus overselectivity (LeBlanc et al., 2003). Video modelling has been trialled across children with ASD by a large number of researchers (Alzyoudi, Sartawi, & Almuhir, 2015; Avcioglu, 2013; Charlop-Christy, Le, & Freeman, 2000; Halle, Ninness, Ninness, & Lawson, 2016; Maione & Mirenda, 2006; and Qi & Lin, 2012). Bellini and Akullian (2007) stated that there are over 200 applications of video modelling that have been reported in print. Researchers have also demonstrated that video modelling generalizes across setting and conditions and that behaviour is maintained for months following the intervention (Charlop-Christy, et al., 2000; Wong, 2015). For example, Nikopoulos and Keenan (2004) examined the effects of video modelling with three children with ASD. They observed social initiation and play behaviours. The videos featured typically developing peers demonstrating social play with the experimenter. All participants increased their social initiation and play skills and this was confirmed by a maintenance follow up at 1 and 3 months. LeBlanc et al. (2003) also studied the effectiveness of video modelling paired with reinforcement. They found it to be effective as all participants went from not performing the target behaviour at all in the baseline phase to an obvious increase in target behaviour during the intervention and follow up phases. Wong (2015) reviewed 17 studies that used video modelling to teach social skills to children with ASD. In seven of the studies, video modelling effectively increased the target behaviour for all participants, in nine of the

studies, video modelling was moderately effective as some participant's target behaviours did not seem to improve, and one study did not find video modelling to be effective.

There are limited literature reviews done on video modelling as an intervention for teaching social skills to children with autism. The limited qualitative reviews make it difficult to compare it to other education and clinical interventions. There is also some uncertainty whether video modelling meets the criteria of evidence-based practice (Bellini & Akullian, 2007). Another limitation is, if a study uses reinforcement, prompting and instruction alongside video modelling it is hard to differentiate whether the increase in the target behaviour is due to the video modelling or the combination of methods.

**Experimental Design**

I used a single-subject, multiple baseline design in this study. I used a multiple-baseline design in preference to a reversal design due to it being unethical and undesirable to reverse improvements in social skills (Cozby & Bates, 2015). Multiple baseline design staggers the start of the treatment across participants, which helps identify that the changes to the target social skill are due to the intervention and not an external factor. I also chose a single-subject design due to the small number of participants used in ABA research. Single-subject design is often chosen as it helps identify the efficacy and viability of treatments in real-life situations (Byiers, Reichle, & Symons, 2012). Single-subject designs are also helpful in demonstrating the effects of a treatment on an individual level, which is helpful when designing a tailored treatment plan for an individual child (Byiers et al., 2012). Butler, Sargisson and Elliffe (2011) stated that it was standard practice in ABA research for the target behaviour to

repeatedly be measured in each phase of the study for a number of reasons: each participant is used as their own control, because of the repeated measures, stability can be assessed, and the success or failure is attributed to the individual participant, which cannot be determined in a group study (Butler et al., 2011). Therefore, I repeatedly measured each participant's target social skill during baseline and intervention and before and after the treatment.

**Research Aims**

The purpose of this study was to look at the efficacy of video modelling in teaching social skills to children with autism and comorbid special needs. In addition to the main purpose of my study, I aimed to show the usability of this method for classroom teachers and caregivers to easily administer. I tried to choose different social skills to show the variability of this method and aimed to create videos that did not limit the generalisation of response and stimuli.

This study is a replication of Joanne Hei Man Wong's thesis 'Teaching children with autism social skills using video modelling'. Wong found that video modelling was effective for three out of four of the social skills taught during the study. My aim was to extend Wong's findings. Wong included modelling of the incorrect behaviour in the videos, which I did not replicate in case it modelled inappropriate behaviours. Secondly, Wong showed the videos to all the children in a classroom simultaneously, and was therefore unable to separate the effect of the video from the effect of any modelling that peers who also viewed the video may have displayed. Wong (2015) reported that for one of the participant's there was a 100% response during a few baseline sessions, which could be attributed to the viewing of other videos. I presented the videos to all the participants individually.

## Method

### Participants

My participants were three boys and one girl aged between five and 10 years old, all classed with intellectual special needs. The four participants were from two different mainstream schools. I gained consent to do the research within the schools by writing a letter to the principal and board of trustees and then by meeting with the principal or the Special Education Needs Co-ordinator (SENCo). The principal and SENCo identified who would benefit the most from the study and the classroom teacher was informed of the study. A meeting was then set up with the teacher, SENCo, and myself. During the first meeting, consent was obtained from the classroom teacher, the teacher was informed of the process of the study, and participant information was discussed. Finally, I obtained consent from the participant's caregivers. I gave all parties involved in the study information regarding the study prior to seeking their consent. Participant information sheets and consent forms are in Appendix A and the letter gaining consent from the principal and board of trustees in Appendix B.

J1 was a 6-year-old boy with a diagnosis of ASD and who was reported to seldom make small talk or reply when he was spoken to or greeted. J1's classroom teacher and I concluded that J1 would benefit from learning to respond to other's greeting or conversation. J2 was an 8-year-old boy with undiagnosed, but suspected ASD and Attention Deficit Disorder (ADD). He displayed deficits in communication, social skills, showing emotion, and learning. The teacher and I identified that J2 would benefit from learning how to initiate and respond to peers' attempts for conversation and play because he mostly interacted with adults and teachers. E3 was an 8-year-old girl with no official

diagnosis but who displayed borderline intellectual disability, autistic traits, developmental delay, blank episodes, and social delay. She was capable of communicating, however, her social skills were not at the same level as those of her age-matched peers. She preferred to interact with adults or play by herself than join in with her peers. The teacher and I decided that focussing on initiating conversation and play would be the most beneficial social skill for E3. H4 was a 10-year-old boy with a diagnosis of ASD and Attention Deficit Hyperactivity Disorder (ADHD). He showed abilities to make friends and ask peers to play, however, he lacked skills in problem solving and turn taking. Therefore the class teacher and I identified turn taking as a social skill that would most benefit H4.

I obtained ethics approval from the School of Psychology Research and Ethics Committee at the University of Waikato (#16:11).

**Setting**

All observations, baseline data collection, video viewing, intervention, and maintenance sessions were held within the school area that facilitated the most natural setting for the behaviour being observed.

For J1, the classroom was the main area used for data collection during observation, baseline, intervention, and generalisation. The video-viewing session was conducted in a room linked to the classroom. There were between 18 and 22 students, one teacher, and two teacher aides in the class during the time of my research. I stood 2 to 3m away from the participant to ensure that I was as unobtrusive as possible during data collection. During intervention, the videos were shown in a room linked to the classroom before school began at 8.45am.

J2 was observed during both class and lunchtime. Observation, baseline,

intervention and generalisation data collection all took place within the classroom and playground. The video-viewing session took place before going outside for lunch in order to avoid disruption during class time, in a room linked to the classroom. There were two teachers and a teacher aide in the class. I stood approximately a metre away from the participant during data collection so that I could hear verbalisations from the participant.

Data collection was taken during morning tea for E3, outside the classroom and on the playground. This ensured the most natural setting for the behaviour being observed for E3. I kept a distance of 1 to 5m from the participant during data collection to ensure the environment was minimally intrusive. During the intervention phase, the video-viewing session took place inside the classroom before E3 went outside for morning tea with the other students.

I initially recorded data for H4 during one-on-one sessions with a Special Education teacher, however, as baseline progressed, I decided that opportunities for the target behaviour were minimal. Baseline, intervention and generalisation data collection was then taken during class time, where five students were taken from the participant's class and a game of basketball was played for 10-15 min. During intervention, the video was viewed just before beginning to play basketball with the classmates.

**Stimuli/Materials: Video and Video Content**

Four to five different videos were created for each participant that was most suited to the social skill behaviours that had been emphasised by the teachers and that I observed. A Samsung nx300 digital camera was used to film the videos and iMovie was used to edit the videos on a MacBook. Each video had

six actors; two who spoke, three in the background and a speaker who explained the behaviour observed in the video. The actors modelled the four target social skills using different scenarios where the social skills could occur.

All videos were recorded inside a classroom or in the playground and were about 1 min long. Each video displayed the target social skill being modelled appropriately, followed by the speaker coming into the scene and explaining the behaviour that had been displayed. The scripts and explanations of each video are attached in Appendix C. The participants did not know the actors or setting of the film.

The actors were typically developing children in a similar age group as the participants, from a local primary school. The actor's age, gender and ethnicity are included in Table 1. The actors volunteered their time and consent was given from the actors and their parents or caregivers.

Table 1.

*Actor Characteristics*

| Actor | Age | Sex | Ethnicity |
|---|---|---|---|
| C1 | 9 | Male | NZ European |
| H2 | 10 | Male | NZ European |
| T3 | 10 | Male | Maori |
| E4 | 9 | Female | NZ European |
| S5 | 10 | Female | NZ European |
| I6 (Speaker) | 10 | Female | NZ European |

**Video for greeting and small talk.**

There were five videos used to teach greeting and small talk. The first actor initiated the conversation by saying either "Hi", "Hi H2", "Good morning", "What did you do on the weekend?" or "Hey. How are you?" and the second actor responded by saying either "Hi", "Hi T3", "Morning", "I played rugby, what did you do?" "Good, how are you?". The first actor responded to the second actor's question for the last two videos. Three of the videos were simple greetings, where the response was similar or the same as the initiation. The other two videos were clips of small talk where the response was paired with a question for the first actor to answer.

**Video for initiating and responding to conversation and play.**

There were five videos made for responding to conversation and play, however, for J2, videos on initiating conversation and play were also shown during video-viewing sessions. Videos for this target behaviour all included scenarios in which a conversation was started or one actor was asked if they want to play, work or eat with the main actor to which the responses were usually positive, for example, "yes, please". In one video, however, the response was 'no', to ensure that the participant did not think that they always had to comply or agree with their peer's requests.

**Video for initiating conversation and play with peers.**

Four videos were used to illustrate appropriate ways of initiating conversation and play. The videos all had one actor asking a question such as "Can I play with you?", "Can I join you?", "Do you want to play with me?" and the other actor responded positively by saying something like "yes" or "okay". In three of the videos, the second actor responded by immediately complying and

in one video, the second actor asked the first actor to wait until they had finished doing what they were doing.

**Video for turn taking.**

Turn taking was modelled in four videos. The first actor said "Hey, can I have a try please?", "Hey, can I have a turn on that after you?", "Hey, can I play with you?" and "Hi, can I use that please?" and the second actor responded by either saying "yes" and handing over the item was that the first actor wanted or by asking the first actor to wait until they were finished.

## Dependent Variables and Data Collections

I took detailed notes and marked a 5-min interval tally chart to record all observation, baseline, intervention, and generalisation data for all social skills. The tally chart and note-taking templates are in Appendix D.

**Definitions of the four target social skills.**

***Greetings and small talk.*** J1 provided a correct greeting response when somebody made a greeting or small talk initiation directed at him for example: "Hello", "Hi J1", "Hi J1, how are you?" "Good morning", "What did you do on the weekend?" and he responded appropriately for example, if he replied saying "Morning", when he was greeted. J1 provided an incorrect response if he did not reply to an initiation or replied saying something unrelated, for example, if his teacher said "Good morning, J1" and he replied say "Lightning Mcqueen car". The dependent variable was the percentage of correct greeting and small talk responses as seen in Equation 1

.

$$\frac{Number\ of\ correct\ greeting\ responses}{Number\ of\ correct+incorrect\ greeting\ responses} \times 100 \quad \text{.....Equation 1}$$

*Inclusions:*

- Greeting and small talk responses spoken by J1 can be identical to initiator's
- Greeting and small talk response with no eye contact

*Exclusions:*

- Appropriate greeting response followed by echo of his name. E.g. "Hello J1" and J1 responded with "Hello J1".

***Initiating and responding to conversation and play.*** J2 gave a correct response or initiation if he verbally and independently responded to other's initiations directed at him to play or have a conversation or if he initiated play and conversation with his peers. No initiation, nonverbal initiation or an incorrect response was given if J1 ignored his peers' attempts, played near peers or watched them during lunch time or if he made no attempt to play or talk to them. Example: "Hey J2, do you want to play with me? – Yes please", "Did you finish your work? – No, have you?", or "Can I sit with you for lunch – Sure J2". The dependent variable was the percentage of verbal responses and initiations made as shown in Equation 2.

$$\frac{Number\ of\ correct\ initiations\ and\ responses}{Number\ of\ correct+incorrect\ initiations\ and\ responses} \times 100 \quad \text{.....Equation 2}$$

*Inclusions:*

- One word initiations or responses "yes", "okay", "no", "play"
- Verbal response without eye contact
- Any verbal response that was an answer to an initiation

- Any verbal initiation to start a conversation or to play with peers

*Exclusions:*

- If J2 responded with an echo of the initiation
- Non-verbal initiation or response such as sitting near peers, following closely as they play, nodding or shaking his head

***Initiating conversation and play with peers.*** A correct response was recorded when E3 independently and verbally requested others to play with her or if she asked if she could join in with others. A correct initiation was also recorded if E3 began a conversation with a peer. An incorrect response was marked if she made no attempt at play or talking to her peers during each 5-min interval. Example: "Hey ****, will you play with me?", "Can I please play with you?", or "What did you have for lunch?". The dependant variable was the percentage of verbal initiations for conversation or plays made of all initiations, as in Equation 3.

$$\frac{Number\ of\ correct\ verbal\ initiations}{Number\ of\ verbal\ and\ non\ verbal\ initiations} \times 100 \quad \text{.....Equation 3}$$

*Inclusions:*

- One-word initiations such as "play?"
- Any verbal initiations for play to another person
- Any independent verbal initiation for conversation with a peer
- Verbal initiations despite no one listening or responding to them

*Exclusions:*

- Verbal initiations after an adult provided a prompt
- Non-verbal initiations as playing alongside peers
- Made verbalisations that expressed a problem "No one will play with me", "I have no friends"

***Turn-taking.*** A correct response was recorded when H4 independently and verbally asked for a turn during a game or for an activity being used by an adult or peer. Example: "Hey ****, can I have a go after you?", "Can I have a turn playing that game?", "Is it my turn now?", or "You may go, it is your turn". As well as giving other children a turn at an activity when they requested a turn. The dependent variable was the percentage of correct requests and allowing others a turn, as in Equation 4.

$$\frac{Number\ of\ correct\ turn\ taking\ responses}{Number\ of\ correct+incorrect\ turn\ taking\ responses} \times 100 \quad \text{.....Equation 4}$$

*Inclusions:*

- One/two-word requests such as "play", "my turn"
- Any verbal request for a turn
- Verbal requests despite no one listening or responding to them
- Verbally responding to others when they request a turn from H4
- Non verbal response to someone requesting a turn, i.e., throwing the ball to them

*Exclusions:*

- Verbal requests after an adult provided a prompt

- Made noises that were not words
- Handing activity over only after the teacher has requested them to give peers a turn

## Procedure

**Interviews.** I interviewed the classroom teacher and, in some cases, the SENCo was also present. These interviews took place prior to observation and data collection. During the interview, I asked a number of questions regarding the participant's social skills, history, background and preferences, in the cases where reinforcement would be needed. The interview questions can be found in Appendix E. I chose the target social skills partly based on information given during the interviews. A questionnaire from Vineland Adaptive Behaviour Scales (VABS) was given to the teacher and parent or caregiver, during the interview, to obtain more information regarding the possible social skill to target. The VABS is a widely used assessment scale for people with autism and has been found to be very reliable in assessing an individual with ASD's daily functioning (Kramer, Liljenquist, & Coster, 2015; Wong, 2015). I used only the socialisation subscale of the VABS in which the questions involved the participants' interpersonal relationships, play and leisure time, and coping skills. The questionnaire can be found in Appendix F.

**Experimental design.** A single-subject multiple-baseline design across subjects was used to assess the outcome of the intervention. Participants were monitored during a baseline condition that began all at the same time at the beginning of the school term (A) until I applied the intervention (B) to the first participant with the most stable baseline. The remaining three participants were

introduced to the intervention phase one-by-one as their baseline data demonstrated stability. I determined that the baseline was stable when there had been 3 to 4 sessions with similar response scores, i.e., E3 had a correct response score of 29% at Session 15, 33% at Session 16 and 33% at Session 17; intervention was then introduced at Session 18.

**Observation.** All students were observed for a number of half-hour sessions over a month to determine whether the social skills highlighted in the interview and questionnaire were the most suited social skill to target. The observation assisted me to narrow down the social skills to a very particular behaviour, rather than targeting a broad issue, for example, the interview and questionnaire highlighted that J2 played by himself during lunch breaks. Upon observation, it was noted that he did not initiate conversation or play nor did he respond when his peers attempted to talk to him. This helped with the selection of the target behaviour for J2. I observed each participant in a many different settings and with different people in order to determine the most appropriate setting in which to target the social skills.

**Baseline.** Participants received the intervention in the following order; J1 after 13 baseline sessions, E3 after 17 baseline sessions, H4 after 17 baseline sessions, and lastly J2 after 24 baseline sessions.

***Greeting and small talk.*** Baseline data for J1 took place in the classroom during mat time, first thing in the morning. The classroom teacher greeted J1 as he walked into the classroom, during roll call and J1's teacher aide would greet him as she came into the classroom 15 min later. I also greeted J1 or made small talk, if a natural occasion arose. Small talk was facilitated by the teacher during mat time by asking J1 and his peers what they did that weekend, if they had

anything to show and tell or asking how they were doing. J1's responses were either marked as 'correct' or 'incorrect' or if no opportunities occurred during the 5-min interval for the target social skill 'no behaviour' was marked. During baseline data collection, the teacher, teacher aide, or I seldom reminded J1 of what should be said or to repeat himself if he mumbled. This was a continuum of what they already did with J1 before the study and I did not mark a response as correct if it came as a result of being told what to say.

***Initiating and responding to conversation and play.*** Baseline data for J2 was taken during the last 10 min of class time and the first 20 min of morning tea. Data were recorded as 'response' or 'no response' if J2's peers initiated conversation or play and 'verbal initiation' or 'non-verbal initiation' if J2 attempted to play or start a conversation with his peers. 'No initiation' was marked if J2 made no attempt to play or have a conversation with his peers. During baseline data collection the teacher aide encouraged J2 to play or have conversations with his peers as part of his Social Skills programme. I did not mark a response or initiation as correct if it came as a result of being told what to say or do.

***Initiating conversation and play.*** I recorded baseline data for E3 outside the classroom and in the playground during morning tea. I marked any initiation from E3 as either 'verbal', 'non verbal' if she tried showing initiation with body language, or 'no initiation' if no initiation occurred during the 5-min interval. E3 was prompted a few times to play with her peers by her classroom teacher and once by myself. Her initiation for conversation or play directly after was not marked as correct and this was a common prompt from the classroom teacher as she often chose to play around adults, rather than her peers.

***Turn-taking.*** I took baseline data during a one-on-one session with H4's special education teacher, however, after too many sessions where the target social skill was not facilitated, I changed baseline data collection to occur during a game of basketball during class time with five of H4's classmates. Any attempt at turn taking (passing the ball when a team mate called out, asking for a turn, etc.) was marked as 'correct' and when a turn-taking opportunity was available but not taken (a team mate asked for the ball and it was ignored, grabbing the ball from a teammate instead of asking for it, etc.), I recorded it as 'incorrect'. During baseline data collection, the special education teacher and I encouraged H4 to ask for a turn or to give the ball when asked for it. This was not a new prompt introduced during the study and a correct response, directly after, was not marked as correct.

**Intervention.**

***Greeting and small talk.*** Participant watched one of five greeting-and-small-talk videos 3 times, in a side room attached to the classroom before class started. Once the video-viewing session was complete, data collection continued identically to baseline data collection. No prompts were made from teacher, teacher aide or researcher during intervention. Reinforcement was administered after videos were watched for this participant in order to have him quietly watch it without being distracted. Reinforcement was either looking at some pictures of his favourite animation or talking about the toy he had brought into school that day.

***Initiating and responding to conversation and play.*** Videos for this social skill were a mixture of 5 videos about responding to conversation and play and 4 videos about initiating conversation and play. One video was watched once

during each viewing, before J2 went out to morning tea, in a room attached to the classroom. Data collection was identical to baseline data collection, before and after the video was viewed each session. The researcher did not encourage or prompt J2 during intervention. There was no reinforcement for this participant.

***Initiating conversation and play with peers.*** Video viewing occurred in the classroom, before E3 went out to morning tea. One of the four videos was observed once during each viewing. Data collection was identical to baseline data collection. There was no prompting from the researcher or teacher.

***Turn-taking.*** During video viewing, H4 viewed one of the four videos on turn taking before play with his peers. The video was watched 2-3 times to ensure understanding. Data collection was identical to baseline data collection. Positive praise was used as reinforcement at the end of each intervention session. No prompts or encouragement were used during intervention phase.

**Maintenance.** Data collection for maintenance was identical to baseline and intervention data collection. No videos were viewed before data collection.

For J1, data were taken 2 weeks after intervention was withdrawn with all the same situations where greeting and small talk would take place (first thing in the morning, arriving at school, teacher aide arriving, etc.).

The maintenance phase for J2 and E3 occurred one week after the intervention was withdrawn.

For H4, data collection was taken one week after intervention had stopped. I tested for generalisation across people by ensuring that the five classmates who played with him were not peers that he had played with before.

## Reliability

**Inter-observer agreement.** Inter-observer agreement (IOA) for all four participants was calculated by having a 3rd-year, Social Work student independently record data intermittently during the intervention and maintenance phases. IOA was recorded for approximately 14% of the sessions for J1, 12% of the sessions for J2, 13% for E3, and 16% of the sessions for H4. IOA was calculated by dividing the total number of agreements between mine and the observer's data by the total number of agreements and disagreements where IOA took place. This was then multiplied by 100 to get the percentage of IOA for each participant as seen in Equation 5. I found that IOA was 100% for J1, 92% for J2, 97% for E3 and 99% for H4.

$$\frac{Number\ of\ agreements}{Number\ of\ agreements+disagreements} \times 100 \quad \text{.....Equation 5}$$

**Social validity.** I gave a questionnaire, inquiring into the social validity of the study, to the teachers of the participants. This questionnaire can be found in Appendix G. I also gave the teachers the same Vineland II questionnaire as they completed before the study began, in order to assess any changes that they may have noticed in the participants' behaviours.

## Results

### Questionnaire

I gave each of the teacher's the Vineland (II) questionnaire before beginning the study and after the study had been completed. This was to assist me in identifying any changes in the participant's social skills. I focused on two subdomains in the Socialization domain of the survey; interpersonal skills, and play and leisure time (Sparrow, Cicchetti, & Balla, 2005). The questionnaire is scored according to whether the activity 'almost always' (90% and above); 'often' (50%-89%); 'sometimes' (10-49%); 'rarely' (less than 10%); or 'never' (0%) occurs. I calculated each participant's score by adding each of their scores for each subdomain, before and after the study and divided it by the highest possible score (20 for interpersonal skills and 24 for leisure and play time) and then multiplied it by 100 to get a percentage. The results can be seen in Table 2.

Table 2.

*Participants Socialization scores before and after intervention for interpersonal skills and leisure and playtime*

| Participant | Interpersonal Skills | | Leisure and Play Time | |
|---|---|---|---|---|
| | Pre | Post | | Pre |
| J1 | Sometimes (35%) | Often (65%) | J1 | Sometimes (35%) |
| J2 | Sometimes (25%) | Often (55%) | J2 | Sometimes (25%) |
| E3 | Sometimes (40%) | Sometimes (45%) | E3 | Sometimes (40%) |
| H4 | Often (75%) | Almost Always (95%) | H4 | Often (75%) |

Overall an increase was seen for all participants from their pre- to post-study scores. The increase was significant both for interpersonal scores, $M_{Before}$ = 43.75, 95% CI[22.44, 65.06], $M_{After}$ = 65.00, 95% CI[43.83, 86.17], $t(3) = -3.60$, $p = .04$, $r = .85$, but not for play and leisure time scores, $M_{Before}$ = 33.50, 95%

CI[25.80, 41.20], $M_{After}$ = 51.25, 95% CI[40.47, 62.03] $t(3) = 2.44$, $p = .09$, $r = .16$.

**Behaviour Observation Data**

The percentage of correct social skills during baseline, intervention, and maintenance for all four participants can be seen in Figures 1 to 4. I observed between 13 to 24 baseline sessions, between 7 and 15 intervention sessions, and one maintenance session, for each participant. The intervention increased the correct behaviour clearly for two children; marginally for one, with a clear reduction in variability; and it was unclear for one child.

**Greeting and Small Talk**

J1 completed 13 baseline sessions, 14 intervention sessions, and one maintenance session (see Figure 1). For all sessions there were constant prompts for greeting and small talk as data collection was always conducted when he arrived at school in the morning. Therefore, I observed arriving at school, coming into class, during morning mat time and when his teacher aide arrived 15 min later.

Baseline sessions contained all the same prompts as the intervention sessions. There was a consistency of around 20% correct responses during baseline sessions, however there were no correct responses during Sessions 1, 4, and 9, and in Sessions 5 and 11 there was an increase in correct responses to 40% and 50% correct respectively.

At Session 14, I introduced the video-viewing sessions. Almost instantly, the percentage of correct social-skill behaviours increased. By Session 19, correct responses had exceeded the highest correct response in baseline and continued to increase until reaching 100% correct responses by Session 25. I stopped the intervention when two consecutive sessions of 100% correct

responses had been achieved.

I completed a maintenance session 2 weeks after the intervention had been ceased. During this maintenance session, J1 produced 90% correct responses.

**Initiating and Responding to Conversation and Play**

J2 completed 24 baseline sessions, 9 intervention sessions, and one maintenance session (see Figure 2). I collected data during the last 10 min of class to see if J2 made conversation during class and the first 20 min of morning tea to see if J2 initiated play or to eat his lunch with his classmates or if he responded to their initiations.

I did not see a consistent trend of correct initiations or responses within J2's data. The percentage correct responses and initiations increased until Session 7 and then were quite variable, with increases and decreases throughout the remainder of the study. At the time baseline data collection began, a Social Skills programme had been implemented for J2 and a small group of other students. The programme was put in place to increase the children's social skills, as well as facilitate friendships amongst them. This began a friendship between J2 and one particular student. The teacher aide reported that the two students were having organised playtime outside of school by the parents. They often played one-on-one, but occasionally played with the other children from the social skills programme. I recorded the days that the friend was absent from school or did not play with J2 and it correlated to the days that he had zero correct response and initiations. I decided that baseline was stable enough to move into intervention phase because from Session 20 to 24 the correct initiations and responses ranged from 38% to 67%.

I began video viewing at Session 25. The percentage of correct responses had been consistently increasing, however, at Sessions 28, 29, and 33, there was dramatic drop or no correct initiations or responses which were the days that his friend had not been at school or had not played with him. I withdrew the intervention after Session 33 due to time constraints with school holidays.

A week later, I conducted a maintenance session, where J2 had a correct initiation and response score of 72%. Overall, it is not clear whether the intervention successfully increased initiating and responding for J2.

**Initiating Conversation and Play**

E3 completed 17 baseline sessions, 13 intervention sessions, and one maintenance session (see Figure 3). I collected data during morning tea from 10.45am to 11.15am. The first 15-min data collection was taken outside the classroom as the children ate their morning tea and the last 15 min was on the playground.

Correct responding during baseline sessions started high with correct initiations of 43%, however it was inconsistent and during Sessions 4, 6, 7, 8, 11, and 12 there were zero correct initiations. The correct initiations became more consistent between Session 13 and 17. I decided that the baseline was stable enough to move on to the intervention phase by Session 17 because of the consistency of correct initiations between those five sessions

I delivered 13 intervention sessions and an increase can be seen starting at 22% at Session 18 and ending at 70% at Session 30. The highest correct initiations were at Sessions 27 and 28 where it was 78% and 75% correct initiations. I withdrew intervention at Session 30 due to time constraints.

I went back for a maintenance session 1 week later, where E3 had a

correct initiations score of 72%.

**Turn Taking**

H4 had 17 baseline sessions, 7 intervention sessions and 1 maintenance session (see Figure 4). I initially took baseline data collection during a one-on-one session with a special education teacher, however we were not experiencing enough trials to produce data (4 or fewer trials per session were not included in the data). Therefore baseline data collection was changed to basketball games during class time.

I did not see a stable trend during baseline data collection. Sessions 1, 2, 4, 7, and 14 all had zero correct responses and Session 12 had the highest correct response for baseline data collection with 67% correct responses. Although the percentage of correct responses were still increasing, I did not think that baseline was very stable, however I introduced the intervention at Session 18 due to the time constraint with the approaching school holidays.

Across the seven intervention sessions, an increasing trend can be seen, with only an occasional drop. Overall, it is difficult to determine if there was a clear increase in correct responses but a reduction in the variability in the presence of the target behaviour can be seen. The correct target behaviour was present more often and was less variable than in baseline.

I ran a maintenance session 1 week after the end of the intervention and H4 produced 69%a correct responses.

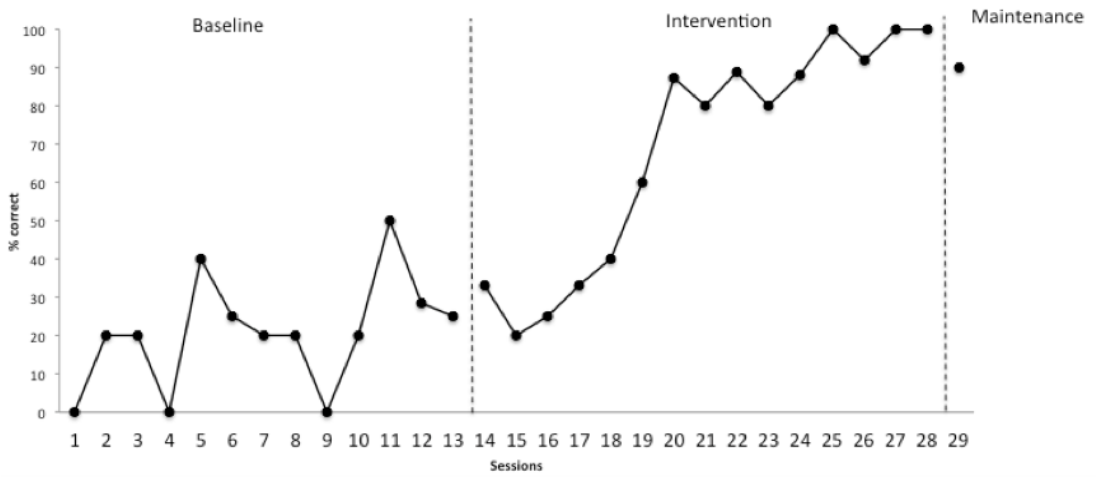


*Figure 1.* Percentage of correct greeting and small talk responses during baseline, intervention and maintenance data collection for J1.

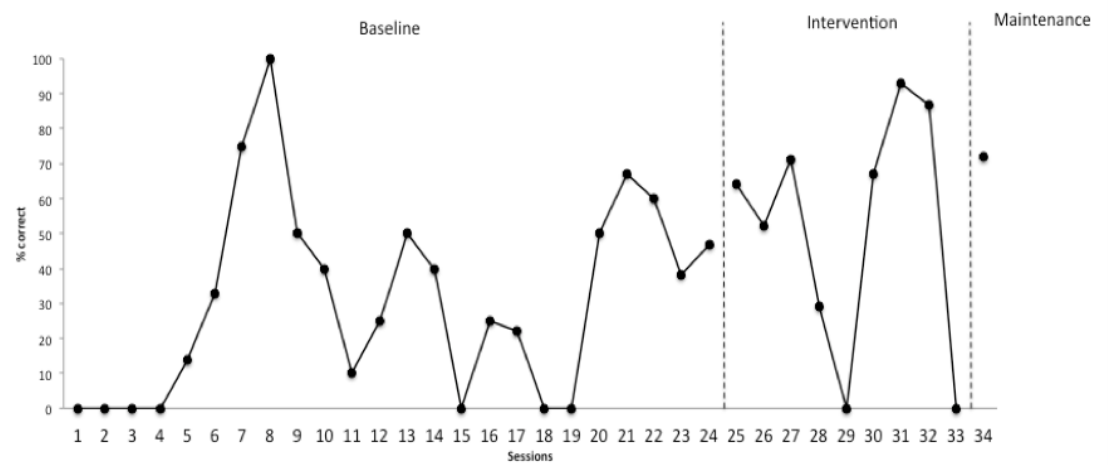


*Figure 2.* Percentage of correct initiations and responses for conversation and play during baseline, intervention and maintenance data collection for J2.

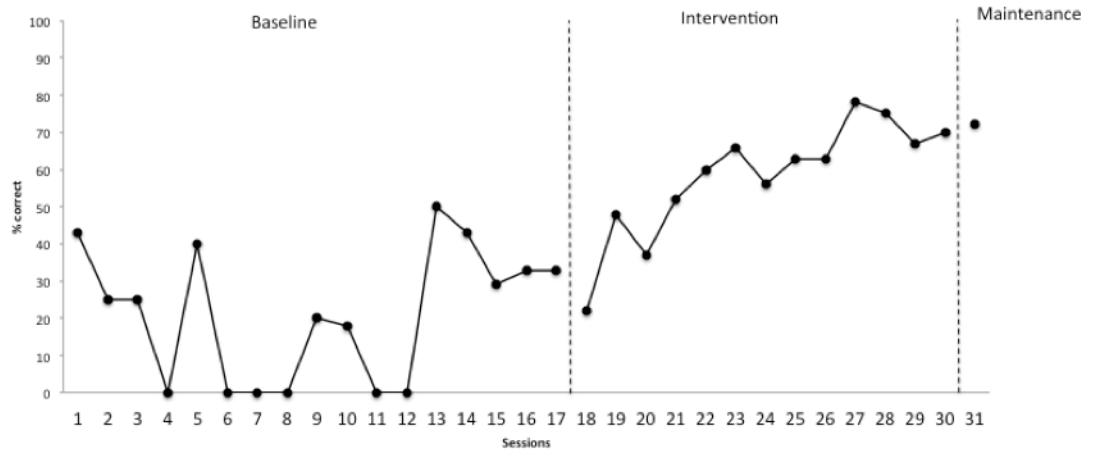


*Figure 3.* Percentage of correct initiations for conversation and play during baseline, intervention and maintenance data collection for E3.

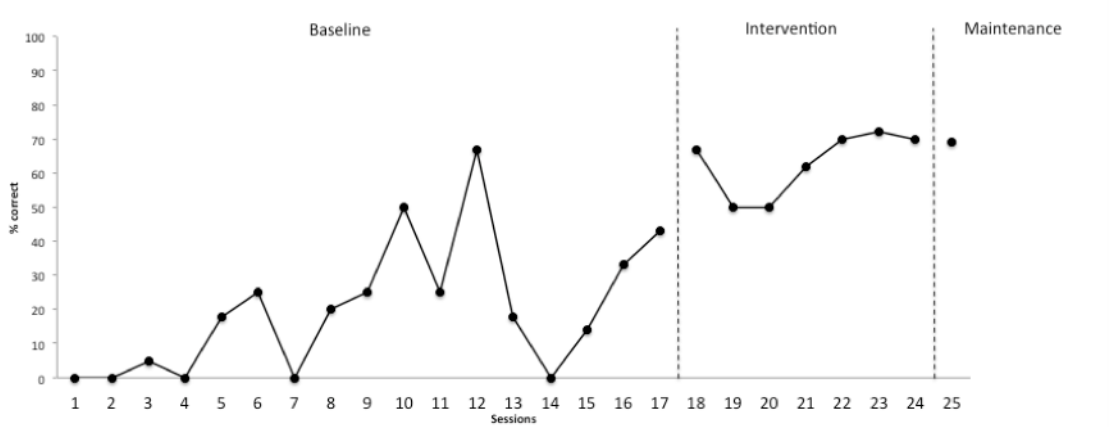


*Figure 4.* Percentage correct turn taking initiations and responses during baseline, intervention and maintenance data collection for H4.

**Time Measure**

I recorded the length of time I took to film, edit, and view the videos. Details about the approximate time it took can be seen in Table 3. It took me approximately 15 min to plan, prepare, and film each video. I edited the videos, which took me approximately 5 min per video. J1's 5 videos together were about 1 min long, J2's 5 videos about 1.5 min, E3's 4 videos about 1.5min, and H4's 5 videos together were about 1.5 min long. J1's videos were each an average of 12 sec long and he had 15 intervention sessions, J2 had 9 intervention sessions with an average of about 18 sec per video, E3's videos averaged 18 sec and she had 13 intervention sessions and H4 had 7 intervention sessions and his videos were on average 15 sec long.

Table 3.

*Total duration of the video creation process and the presentation during intervention*

| | J1 | J2 | E3 | H4 |
|---|---|---|---|---|
| Planning, preparation and filming | 1 hour 15 min | 1 hour 15 min | 1 hour | 1 hour 15 min |
| Editing | 25 min | 25 min | 20 min | 25 min |
| Viewing | 3 min | 2.5 min | 4 min | 2 min |
| Total time | 1 hour 43 min | 1 hour 42.5 min | 1 hour 24 min | 1 hour 42 min |

**Social Validity**

I gave each of the teachers a questionnaire to inquire into the social validity of my study. The teachers rated that they agreed with the procedures of the assessment that took place, the information that they received throughout the course of the study, the goals of the study, and the results of the study. All teachers were satisfied with the video modelling as a teaching method for the participant, however one teacher, particularly felt it was the most appropriate method for their student. All teachers strongly agreed that they were satisfied with the conduct of the researcher.

## Discussion

My study aimed to determine whether video modelling could be used to teach social skills to children with autism and comorbid special needs. I used four types of target social skills; greeting and small talk, initiating and responding to conversation and play, initiating conversation and play, and turn taking. In the following discussion, I will discuss the findings of my study and compare them to the results of other studies, including Wong's (2015) that was the basis for my study. I will also discuss the usability, strengths and limitations of my study, and implications for future research.

### Greeting and Small Talk

Overall, J1's results show that video modelling was highly effective in teaching him greeting and small talk. J1 had 100% correct responses over a few sessions, so I withdrew intervention before the end of the study. I then did a maintenance session 2 weeks later, which showed that the effect of the study had maintained.

Avcioglu (2013), Charlop-Christy et al. (2000), and Litras, Moore, and Anderson (2010) all conducted studies similar to my research, to determine the effectiveness of video modelling on teaching greeting behaviour. All three studies found that video modelling did in fact increase the occurrence of the target social skill, and therefore, J1's findings were consistent with previous research.

Prompting was occasionally used with J1 as a continuation of what usually occurred for him during such situations to ensure the most naturalistic setting. I, however, did not mark the response that followed a prompt as correct. Reinforcement was also used as a motivator for J1 during the video-watching sessions, in the form of looking at pictures of his favourite animation or

discussing what toy he had brought to school after the video had been watched. Charlop-Christy et al. (2000) also used reinforcement in the form of praise to get their participant to look at the model. Reinforcement was not given for a correct response during baseline and intervention sessions for my study, however.

**Initiation and Responding to Conversation and Play**

The effectiveness of video modelling on teaching initiation and responding to conversation and play to J2 is questionable. At the time of observation, before baseline began, J2 showed no attempt to make or reciprocate friendships. However, when I began baseline sessions at the beginning of the new school term, I was informed that a new social skills programme was being implemented for J2 and 4 other students in his class, which was administered by a teacher aide. I was also informed that one particular child in the social skills program was also having organised playtime outside of school to facilitate a friendship with J2. Unlike the other participants, there was no consistency of behaviour through baseline and intervention sessions. For example, consistently low rates of target skill at baseline sessions and a consistent increase during intervention sessions. There was a correlation between zero correct responses and the days where this particular friend was absent from school or was playing with other students, which implies that J2's increase in the target social skill was facilitated by his friendship with that particular child.

Litras et al., (2010), Maione and Mirenda (2006), and Halle et al. (2016) all looked at both social initiations and responses. All these researchers found video modelling to be highly effective in increasing social initiations and responses. Other studies by Alzyoudi et al. (2014), and Nikopoulos and Keenan (2003) who studied initiations and responses separately, also consistently found

that video modelling is an effective method for teaching initiations and responses to conversation and play. So, although it is not possible to attribute my intervention with improvements in J2's initiations and responses to conversation and play, previous research suggests that video modelling is effective in increasing the prevalence of these skills.

It would be interesting to know how effective it would have been for J2, had the social skills programme not begun at the same time as baseline sessions. However, once the social skills programme had ended, intervention had already begun and due to time constraints, I could not continue the study any longer.

**Initiating Conversation and Play**

Overall, I found using video modelling to teach initiations for conversation and play for E3 to be effective. While she did not have 100% correct responses by the end of the study, an increase was seen once intervention sessions were introduced. Her responses did fluctuate at times during intervention as well, however her behaviour was less variable than during baseline sessions. The maintenance session conducted, after the intervention had been withdrawn, showed that the effect of the intervention was maintained.

An interesting point to take into consideration was that when I was observing E3, I noticed that even though she made attempts to initiate conversation and play with her peers, they did not always respond appropriately to her initiations. E3's teacher reported that she lashed out at her peers during class time, which could have had an effect on the way they responded to her attempts. Salend and Garrick Duhaney (1999) stated that often children with a disability are not as accepted, or are judged differently than their typically

developing peers. Which may be another reason that E3's attempts to initiate conversation and play were not always welcomed by her peers.

Halle et al. (2016), Litras et al. (2010), Maione and Mirenda (2006), and Nikopoulos and Keenan (2003) all studied the effectiveness of teaching social initiations using video modelling and were consistent in their findings that it was effective.

I used prompting occasionally with E3, as it was something that E3's teacher did prior to the study taking place. Prompting included phrases like "Why don't you go talk to your friends?" My procedure was consist with that of Maione and Mirenda (2006) who also used prompting for some of their activities.

**Turn Taking**

The results for turn taking show that while video modelling was somewhat effective, the effect was limited. Midway through baseline data collection, I decided that there were not enough opportunities for the target behaviour to be seen during H4's one-on-one time with his special education teacher. We then changed settings to a more natural and social setting, however, the number of times that observation could take place per week were limited. An immediate increase in turn taking can be seen with the introduction of the intervention (Figure 4), however, the results may have been clearer had there been more sessions. I conducted a maintenance session after I withdrew intervention, which showed that the effect of the intervention had been maintained.

Kroeger, Schultz, and Newsom (2007) and Marzullo-Kerth, Reeve, Reeve, and Townsend (2011) both studied the effectiveness of video modelling as a

method for teaching turn taking to children with autism and found positive improvements in their participant's target behaviour.

I occasionally used prompting during this study, as it was used prior to my study beginning. A response that directly followed a prompt was not marked as correct.

**Overall Discussion**

The ultimate goal of my study was to demonstrate the efficacy and usability of video modelling as a resource for teaching social skills to children with autism and similar special needs. The overall results show improvements for three of the four participants, implying that video modelling is an effective tool that could be implemented to children that have autism and other special needs. There were some improvements in J2's results, however, it is unclear if it can be attributed to this study. Qi and Lin (2012) found that their study also suggested that video modelling might sometimes be more effective for some participants than others.

The Vineland II scores from before and after the study also show that the interpersonal skills and how children used their play and leisure time increased across all participants.

Avcioglu (2013) and Litras et al. (2010) used reinforcement alongside video modelling to increase the occurrence of the desired behaviour, however my study was consistent with Wong's (2015) findings that video modelling could be just as effective without reinforcement. My results lend support to the findings of Avcioglu (2013), Charlop et al. (2000), Litras et al., (2010), and Wong (2015) that video modelling is effective in teaching social skills, with or without reinforcement. It is more labour intensive to include reinforcement and

prompting, therefore it would be up to the person working with the individual with autism as to whether they included reinforcement and prompting or not. The practical implication from my study is that it will produce similar results.

The results of generalisation were not a particular focal point of this study. However, Wong (2015) found positive results for generalisation across stimuli and response. With this information, I ensured that multiple actors and a variety of stimuli were modelled in the videos. All participants had multiple teachers and students involved in the study which would attribute to generalisation if it were being examined.

I measured the time it took for the preparation, filming, editing, and viewing of the videos in order to demonstrate the usability of video modelling as a method for teachers and caregivers. It took me 4 hours and 45 min to prepare and film the videos, 1 hour and 35 min to edit the all films, and 11.5 min for all the videos to be viewed over the entire course of the study. Therefore the total time to create the videos for viewing was 6 hours and 20 min. There were no costs involved in the creation of the video, as the actors were school students who volunteered their time. Wong (2015) also measured the time it took to create the videos for the same amount of participants, and the total time was 8 hours. This demonstrates the usability and ease of creating a few videos, as the time would be significantly less for one child, and the videos could be added to a library and used for other children who stand to benefit from the particular social skills modelled in the videos. The videos also required very little time to view, which means that it could be played often without disrupting the participant's other activities and programmes.

I made some changes when replicating Wong's (2015) study. I evaluated

the success of the video modelling in the absence of modelling an incorrect behaviour as I didn't want to inadvertently encourage incorrect behaviour. However, I did not find that is had more of an improvement on the target social skills than Wong's (2015) study. I also did not show the video to the entire class as I wanted to separate the effect of the video modelling from any potential effect of peer behaviour that might have resulted from peers watching the videos. All my participants were in different classes and at different schools so they did not all watch the same videos. In spite of these differences, my findings suggest that my approach was no less effective than those of Wong.

**Strengths.** The most obvious strength of my study is that there was a positive improvement in all four of my participant's social skills, even if we cannot judge the extent of the influence on J2's behaviour.

The multiple exemplars of stimuli and responses in the videos would have been an advantage for generalisation, compared to if I had only showed videos of a participant's favourite animation toy, for example. All my videos demonstrated a variety of different settings, items, actors, and ways of displaying the social target skill. There were also a variety of teachers, teacher aides, and students involved in the intervention sessions.

I ensured that the most naturalistic and unobtrusive settings were used for observation. It was important that my presence did not alter the behaviour of the participant or their teacher and peer's behaviour towards them.

Another strength of my study is that Vineland II and social validity questionnaires confirmed the robustness of the results.

I showed all video sessions on a small MacBook Air laptop for ease and quick accessibility to the video. Using a popular piece of technology assisted in

keeping the participants attention on the task.

**Limitations.** Occasional prompting during the study and instructions for each video meant that I couldn't determine the effectiveness of video modelling alone. Video modelling is often paired with reinforcement, prompting, coaching, manipulating the antecedent, practise sessions, and instruction on the videos (Alzyoudi et al, 2015; Anderson et al., 2016; Bellini and Akullian, 2007; Charlop-Christy et al., 2000; Litras et al., 2010; Maione & Mirenda, 2006; and Nikopoulos & Keenan, 2003). Therefore, there is limited research demonstrating the effectiveness of video modelling alone and it would have been an advantage if I could have shown the effect of video modelling in isolation.

I did not examine the effects of the multiple exemplars for stimuli and response generalisation used in my study, which would have contributed to the currently limited literature in this area (Wong, 2015) and further validated the effectiveness of video modelling in teaching social skills.

Maintenance was only measured once, and a week to two weeks after the intervention had been withdrawn. It would have been more informative to have measured maintenance over a long term basis of a few month and at a number of sessions.

Lastly, another limitation to my study was that the effectiveness of video modelling in teaching social skills was limited to school settings. Therefore I cannot comment on whether the improvement of the target social skills generalised to other settings.

**Future research.** Future research could examine generalisation outside of a school setting as well as the effectiveness of video modelling without any instruction or prompting. Furthermore, different types of special needs and

different age groups could be studied using the same procedures as my study.

**Conclusion**

The effectiveness of video modelling as a resource for teaching social skills to children with autism spectrum disorder and other deficits in social skills was demonstrated in my study. I focused on greeting and small talk, initiation and responding to conversation and play, initiation for conversation and play, and turn taking as my four social skills. The results and research discussed in my study have shown than video modelling is an effective method of teaching social skills. I have also demonstrated that it is an easy tool for teachers and caregiver to use without the help of a professional. I also discussed many possible strengths, weaknesses, and implications for future research.

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## Appendix A: Participant Information Sheet and Consent Form

Ψ School of Psychology

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

### PARTICIPANT INFORMATION SHEET

(Child's caregiver)

**Project title:** Teaching Children with Autism Social Skills using Video Modelling
**Names of Researchers:** Amy Turner, Dr. Rebecca Sargisson and Prof. Mary Foster

**Researcher introduction**

My name is Amy Turner. I am a Masters student at the University of Waikato. My Master's degree specializes in Psychology and I am in my second year of the Applied Behaviour Analysis program. I am working alongside Dr. Rebecca Sargisson and Prof. Mary Foster, my supervisors.

Your child is being invited to participate in a research study assessing video modelling as a way of teaching social skills. Whether you choose to allow your child to participate is a choice entirely up to you. If you decide to allow your child to take part in the study but change your mind later, you can withdraw from the study at any time before observation of your child begins. You do not need to provide a reason for withdrawing or deciding to not take part and will not be disadvantaged if you do so. You have the right to ask that any data to be withdrawn/destroyed.

The study typically takes about 6 months over a number of sessions. We will work with your child to ensure the study is not taxing. This study should benefit your child and will not be a risk to them. Benefits include; improving your child's social skills, teaching your child how to make social initiations and how to give compliments and your child should begin to experience better social

relationships with the people around them. Your child will not be removed from important class time and their participation will not affect their grades.

Feel free to ask questions at any point. If you have any questions as a result of reading this information sheet, you should ask the researcher before the study begins.

**Project description:**

My research looks at video modelling as a way to help increase social skills in children with autism. It is a replication of a previous study by Wong, J. H. M. with adjustments to some limitations. In my research, the primary objective is to increase the social skills of the children with autism. I am wanting children on the autism spectrum whose social skills are not that of a child their age.

**Project Procedures:**

Each child's social skill needs will be determined through a questionnaire filled out by the teacher and yourself, the caregiver and then followed by an interview that will be conducted with the caregiver and teacher. The child will then be observed in their natural environment displaying their current social skills. Videos displaying social skills will be shown to the child during free time. The child will then be observed again and their social skills will be recorded again.

Incentives will not be used unless the social skills do not improve, in which case, incentives such as favoured activities will be brought in to motivate the child. Such incentives will be determined during the interview with yourself and the teacher.

A couple of follow up sessions will be conducted three months after the last session in order to see if the social skill taught had maintained.

The same questionnaire will be completed at the end of the study to compare progress.

**Confidentiality:**

Your child's identity will be kept confidential at all times. Consent forms will be stored in a locked area on the Waikato University grounds in Tauranga. Any data collected will be stored on a USB stick and kept in a safe location as well. After the study is completed, all original data will be deleted and the USB will be rewritten. All data and forms will be kept for 6 years and is only accessible by myself and my Supervisors.

The results within the study will only include your child's age, sex, diagnosis and social deficit. Numbers will be given to each child to avoid readers identifying the children.

I can make your child's results accessible to you at any point during the study. Your questionnaire will remain confidential, as well as all your details. You will never be mentioned during the study.

I ensure you that you and your child's anonymity will remain to the best of our ability.

**Contact details:**

If you have any questions, concerns or complaints about the study at any stage, you can contact:

Amy Turner (Master student)
0211723910
aturner.psyc@gmail.com

Dr. Rebecca Sargisson (Supervisor)
07 838 4032 Ext 378673
rebeccas@waikato.ac.nz

Prof. Mary Foster (Supervisor)
07 838 4032 Ext 9208
psyc0182@waikato.ac.nz

For any queries regarding ethical concerns you may contact The University of Waikato Human Participants Ethics Committee, The University of Waikato, Research Office, research@waikato.ac.nz
Telephone 07 838 4166

*Approved by the University of Waikato Human Participants Ethics Committee on 12 April 2016 for 3 years. Reference number 16:11*

Ψ School of Psychology

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

**CONSENT FORM**

(Caregiver)

**THIS FORM WILL BE HELD FOR A PERIOD OF 6 YEARS**

Project title: Teaching Children with Autism Social Skills using Video Modelling

Names of Researchers: Amy Turner, Dr. Rebecca Sargisson and Prof. Mary Foster

I have read the Participant Information Sheet, have understood the nature of the research and why I have been selected. I have had the opportunity to ask questions and have them answered to my satisfaction.

- I agree to take part in this research.
- I agree for my child, _____ (full name) to take part in this research.
- I understand that I am free to withdraw participation at any time, and to withdraw any data traceable to my child and I up to December 15th 2016.
- I understand my child's participation may take up to ten hours over six months.
- I understand my participation may take up to two hours over six months.
- I understand and <u>agree / do not agree</u> with the research procedures regarding the use of video modelling for my child as stated in the Participant Information Sheet.

- I agree / do not agree to have this research take place in other settings including my home.

- I understand that there will be a report published about this research.

- I wish / do not wish to receive the summary findings.

- I understand that my child's teacher will be informed if my child does not display a sufficient number of social skills and an incentive system needs to be implemented.

- I understand that no identifiable information regarding my child will be shared with anyone else.

- I understand that if I choose to withdraw my child and I from this study, the child's teacher and principal will be notified that the researchers no longer need to observe my child.

- I understand that the research could result in the benefits and risks that were stated in the Participant Information Sheet and agree /do not agree to the ways proposed to manage the situation.

- I understand the Board of Trustee / Principal has given assurance that my child's participation or non-participation will not affect their grades or their relationship with the school.

- I understand this Consent Form and results collected of my child will be kept in a secure location for six years, after which they will be destroyed.

- I agree for the summary of my child's results to be emailed to: _____ (e-mail) or mailed to: _____(address) at my request.

Name of caregiver _____

Name of child _____

Caregiver's signature _____Date _____

*Approved by the University of Waikato Human Participants Ethics Committee on 12 April 2016 for 3 Years. Reference Number 16:11*

## Appendix B: Letter To Principal

Ψ School of Psychology

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

Amy Turner
University of Waikato
Masters of Applied Behavioural Psychology
Amsta91@gmail.com
0211723910

To the Principal and Board of Trustees

**Request to recruit students from your school for a Behavioural Psychology study:**

I would like permission to advertise my study within your school to parents and teachers of children with autism.

The purpose of this study is to look at the efficacy of video modelling while teaching children with autism social skills appropriate to their needs. This study will be a replication and extension of Joanne Hei Man Wong's thesis 'Teaching children with autism social skills using video modelling'. My goal is to identify a method that educators and practitioners can effortlessly implement when working with social skills and children with autism.

I will be observing and working with the children a couple of hours a week for about 6 months. I aim to observe them in their natural environment of the classroom or playground and will use free time to work with them specifically.

I have included more information about the study.
I look forward to your response.

Sincerely
Amy Turner

## Appendix C: Scripts and Instructions for Videos

### Greeting responses

Clip 1

T3 – "Hey H2"

H2 – "Hey T3"

Instructions: "When someone greets us, we should greet them back"

Clip 2

C1 – "What did you do on the weekend?"

H2 – "I played rugby, what did you do?"

C1 – "I played on my PS4"

Instructions: "When someone talks to us, we should answer them"

Clip 3

S5 – "Hi"

E4 – "Hi!"

Instructions: "When someone says 'Hello' to us, we need to say 'Hello' back"

Clip 4

T3 – "Hey! How are you?"

S5 – "Good, how are you?"

T3 – "Good, thanks"

Instructions: "When someone talks to us, we should answer them"

Clip 5

E4 – "Good Morning"

C1 – "Morning"

Instructions: "It is polite to greet others when we first see them"

*Figure 5.* Photograph of actors modelling greeting and small talk for J1.

**Initiating and responding to conversation and play**

Clip 1

E4 – "Hey S5. Do you want to play with us?"

S5 – "Yes please!"

Instructions: "When someone asks us to play with them, we should answer then rather than ignoring them"

Clip 2

E4 – "Hey do you want to have lunch with us?"

H2 – "Yes, thank you."

Instructions: "When someone asks us to sit with them, it is because they want to be our friend"

Clip 3

H2 – "How far did you get with your maths?"

S5 – "I finished it, and you?"

H2 – "Not quite finished"

Instructions: "When someone talks to us, we should answer them"

Clip 4

E4 – “Hey S5, do you want to come do your work with us?”

S5 – “Okay!”

Instructions: “We should reply when someone talks to us”

Clip 5

E4 – “Hey H2. Do you want to come play with us?”

H2 – “Oh, no thank you”

Instructions: “It is okay to say no if you don’t want to play with someone, but you should always answer them”


*Figure 6.* Photograph of actors modelling initiating and responding to conversation and play for J2.

**Initiating play and conversation with peers**

Clip 1

S5 – “Hey do you want to play with me?”

H2 – “Yea, sure”

Instructions: “If we want others to play with us, all we need to do is ask”

Clip 2

E4 – “Hey can I play with you guys?”

H2 – “Yea!”

Instructions: “If you want to play with other children, just ask them”

Clip 3 (Children playing tag)

H2 – “Hey can I join you?”

E4 – “Okay”

Instructions: “Ask if you may join in, if you see other children play a game that you would like to play too”

Clip 4

S5 – “Hey can I play with that?”

E4 – “Yes, as soon as I am done with it”

Instructions: “Sometimes we have to wait our turn to play, but we need to ask or they won’t know that we are waiting”

*Figure 7.* Photograph of actors modelling initiating conversation and play for E3.

**Turn-Taking**

Clip 1 (One student is playing with a game that another child wants)

C1 – "Hey, can I have a try please?"

H2 – "Yea, sure"

Instructions: "If you want a turn at something that someone else has, you just have to ask them"

Clip 2 (All the iPads are being used)

E4 – "Hey, can I have a turn on that after you?"

T3 – "Yea, sure. As soon as I am done"

Instructions: "If someone wants a turn with something that you are busy with, you can either give it to them if you are finished or ask them to wait until you are done"

Clip 3 (A student is playing with a ball that another child wants to play with as well)

T3 – "Hey, can I play with you?"

C1 – "Yea, okay. Catch!"

Instructions: "If we want a turn with something, we can ask if we can play with the other person"

Clip 4 (All the skip ropes are being used)

H2 – "Hi, can I have that please?"

S5 – "Yup, I am almost done"

Instructions: "If someone is busy with something that we want, we may have to wait until they are finished"

*Figure 8.* Photograph of actors modelling turn taking for H4.

## Appendix D: Data Collection Forms

**Data collection form for J1:**

Participant: _____ Date: _____ School: _____

Behaviours: _____ Phase: _____

| Time (5min) | Correct | Incorrect | No behaviour | # of trials | Notes |
|---|---|---|---|---|---|
| 0-5min | | | | | |
| 5-10min | | | | | |
| 10-15min | | | | | |
| 15-20min | | | | | |
| 20-25min | | | | | |
| 25-30min | | | | | |

**Data collection form for J2:**

Participant: _____ Date: _____ School: _____

Behaviours: _____ Phase: _____

| Time (5min) | 0-5min | 5-10min | 10-15min | 15-20min | 20-25min | 25-30min | # of trials |
|---|---|---|---|---|---|---|---|
| Response | | | | | | | |
| No Response | | | | | | | |
| Verbal Initiation | | | | | | | |
| Non-verbal initiation | | | | | | | |
| No initiation | | | | | | | |
| Notes | | | | | | | |

**Data collection form for E3:**

Participant: _____ Date: _____ School: _____

Behaviours: _____ Phase: _____

| Time (5min) | Verbal | Non-verbal | No Initiation | # of trials | Notes |
|---|---|---|---|---|---|
| 0-5min | | | | | |
| 5-10min | | | | | |
| 10-15min | | | | | |
| 15-20min | | | | | |
| 20-25min | | | | | |
| 25-30min | | | | | |

**Data collection form for H4:**

Participant: _____ Date: _____ School: _____

Behaviours: _____ Phase: _____

| Time (5min) | Correct | Incorrect | No behaviour | # of trials | Notes |
|---|---|---|---|---|---|
| 0-5min | | | | | |
| 5-10min | | | | | |
| 10-15min | | | | | |
| 15-20min | | | | | |
| 20-25min | | | | | |
| 25-30min | | | | | |

## Appendix E: Interview for Teachers

Ψ School of Psychology

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### Interview Schedule for teachers:

Teaching children with autism social skills using video modelling

Participant name:

Date:

Teachers name:

Demographic Information

Participant's date of birth:

Student gender:

Year level:

Any diagnosis from a medical professional:

Student's diagnosis:

Social behaviour/language information

Does the student regularly use 3-5 word sentences?

Who does the student interact with the most at school? (Best friends? Teacher aide?)

How would you describe the student's social skills?

Are there situations or contexts where the student is more likely to display social skills? (e.g., free time, group activities, etc.)

What are some social skills the student can improve on?

What are social skills the student is strong at?

Preferences:

What kind of activities/ toys does the student enjoy playing or doing at school? (or hobbies/ ask for 3)

Does the student enjoy any particular smells? (e.g., perfume, flowers, pine trees)

Does the student enjoy any particular sounds? (e.g., music, whistles, siren)

Possible for study to be conducted in classroom settings? i.e., set free times in class/ unstructured class time. Explain generalisation)

Other information:

Physiological problems:

Feeding/ toileting/ medication:

Behavioural issues:

## Appendix F: Questionnaire For Teacher And Caregivers

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Te Whare Wānanga o Waikato

Student's name:

Date:

Hi (Teacher),

Thank you for taking the time to complete this questionnaire on (Student)'s social skills. Please mark on the far right boxes with either a 2,1,0, or DK. Response options: 2- Usually, 1- Sometimes or Partially, 0- Never, DK- Don't know

| **Relating to others** | |
|---|---|
| Imitates simple movements (e.g., clap hands, waves good-byes, etc.) | |
| Uses actions to show happiness or concern for others (e.g., hugs, holds, hands, pats arm, etc.) | |
| Shows desire to please others (e.g., shares a snack or toy, tries to help even if not capable, etc.) | |
| Demonstrates friendship-seeking behaviour with others the same age (e.g. says "Do you want to play with me?" or takes another child by the hand, etc.) | |
| Imitates relatively complex actions as they are performed by another person (e.g., shaving, hammering nails, etc.) | |
| Answers when familiar adults make small talk (e.g. if asked "How are you?" says, "I'm fine". If told, "You look nice, " says: "Thank you", etc.) | |
| Repeats phrases heard spoken before by an adult (e.g. "Honey, I'm | |

| | |
|---|---|
| home") | |
| Uses words to express own emotions (e.g. "I'm happy", "I'm upset", etc.) | |
| Has best friend or shows preference for certain friends over others | |
| Imitates relatively complex actions several hours after watching some else perform them (e.g. shaving, hammering nails) | |

| **Playing and Using Leisure Time** | |
|---|---|
| Plays with others with minimal supervision | |
| Uses common household objects or other objects for make-believe activities (e.g. pretends a block is a car, a box is a house, etc.) | |
| Protects self by moving away from those who destroy things or cause injury (e.g., those who hit, throw things, etc.) | |
| Plays simple make-believe activities with others (e.g., plays dress-up, pretends to be superheroes, etc.) | |
| Seeks out others for play or companionship (e.g., plays with others on the playground, invites others home, etc.) | |
| Takes turns when asked while playing games or sports | |
| Plays informal, outdoor group games (e.g. tag, jump rope, catch, etc.) | |
| Shares toys or possessions without being asked | |
| Follow rules in simple games (e.g., relay races, spelling boxes) | |

| | |
|---|---|
| Takes turns without being asked | |
| Plays simple card or board game based only on chance (e.g., Go fish, Crazy eights, etc.) | |
| Goes places with friends during the day with adult supervision (e.g. to a shopping mall, park, etc.) | |

Thank you for your participation.

## Appendix G: Social Validity

Ψ School of Psychology

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

Amy Turner
University of Waikato
Masters of Applied Behavioural Psychology
Amsta91@gmail.com
0211723910

**SOCIAL VALIDITY QUESTIONNAIRE**

(Teacher)

Were you satisfied with the following aspects of the study:

1) I am satisfied with the procedures for assessing my child/ the student's social skills

| Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |
| +2 | +1 | 0 | -1 | -2 |

Comments:

2) I am satisfied with the teaching method (video modelling) used with your child/ your student

| Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |
| +2 | +1 | 0 | -1 | -2 |

Comments:

3) I am satisfied with the goals of the study

| Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |
| +2 | +1 | 0 | -1 | -2 |

Comments:

4) I am satisfied with the information I received about the study

| Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |
| +2 | +1 | 0 | -1 | -2 |

Comments:

5) I am satisfied with the target phrases selected for teaching (social skill)

| Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |
| +2 | +1 | 0 | -1 | -2 |

Comments:

6) I am satisfied with the results from this study

| Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |
| +2 | +1 | 0 | -1 | -2 |

Comments:

7) I am satisfied with the conduct of the researcher

| Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |
| +2 | +1 | 0 | -1 | -2 |

Comments: