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ENHANCING ORAL COMPREHENSION AND EMOTIONAL RECOGNITION SKILLS IN CHILDREN WITH AUTISM: A COMPARISON OF VIDEO SELF MODELLING WITH VIDEO PEER MODELLING

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Abstract

Video modelling has been shown to be an effective intervention with autistic individuals as it takes into account autistic characteristics of those individuals. Research on video self modelling and video peer modelling with this population has shown both are effective. The purpose of this study was to replicate past findings that video modelling is an effective strategy for autistic individuals, and to compare video self modelling with video peer modelling, to determine which is more effective. The studies here used multiple baselines with alternating treatments designs with 6 participants across two target behaviours; emotional recognition and oral comprehension. The first compared the video modelling methods and found neither method increased the target behaviours to criterion, for 5 out of the 6 participants. For 1 participant the criterion was only reached for the video self modelling condition for the target behaviour 'oral comprehension'. The second study first examined the effectiveness of video self modelling and video peer modelling with supplementary assistance for 4 participants. Second, it examined a new peer video for a 5th participant, and third, it compared the two video modelling methods (with supplementary assistance). Results indicated 1 participant reached the criterion in both video modelling conditions, 1 participant showed improvements and 2 participants never increased responding. This study indicated that clarity of speech produced by the peer participant in the peer video, may have contributed to a participant's level of correct responding. This is because a new peer video used during the second study dramatically increased this participants responding. Intervention fidelity, generalisation and follow-up data were examined. Measures of intervention fidelity indicated procedural reliability. Generalisation was unsuccessful across three measures and follow-up data indicated similar trends to intervention. Only video self modelling effects remained at criterion during follow-up. Results are discussed with reference to limitations, future research and implications for practice.

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A large amount of human learning occurs vicariously; that is we learn by observing others (Jesdale & Dowrick, 1991). Under some circumstances, observation of others actions can result in later behaviour change (Jesdale & Dowrick, 1991). According to Bandura's (1977) social learning theory, people learn from one another by means of observation, imitation, and modelling. Through observing other peoples behaviour, attitudes, and the consequences of their behaviour, individuals construct an idea of how to perform novel behaviours and later can use these ideas to guide their actions. Bandura (1986) states that the term observational learning is used to denote behavioural and cognitive changes that occur as a result of observing others engaged in similar actions. Modelling is the term for the process by which an individual demonstrates behaviour that can be imitated (Corbett & Abdullah, 2005). Bandura (1986) proposed that an observer's behaviour will closely resemble that of the individual they observed, dependant on the consequences that follow the model's behaviour (Bandura, 1986). That is, it is more probable that the observer will mimic the model's behaviour when the models behaviour is rewarded, and not mimic it when the models behaviour is punished.

Bandura (1986) hypothesised that observational learning involves four mediating processes; attention, retention, production and motivation. The attentional process refers to the observer attending to and accurately perceiving the model or event. This requires the intake of sensory stimuli and precise attentional focus on the task or event. The retention process involves symbolically processing the modelled behaviour. Retention is enhanced through simultaneous visual monitoring, cognitive practice and behavioural imitation. Accurately producing and overtly rehearsing the modelled behaviour are the activities that are involved in the process of production. Motivation results from the consequences that follow the modelled behaviour. That is; behaviour that is modelled is more likely to be performed by the observer if the behaviour has previously resulted in favourable consequences for the model rather then punishing consequences. This is because observing the outcomes of others actions creates expectations for the outcomes the observer will receive for performing the same behaviour (Schunk, 1987). Favourable consequences can be direct (edibles or social reinforcement) vicarious (observing the consequences of others actions) or self-produced (Corbett & Abdullah, 2005; Jesdale & Dowrick, 1991; & Schunk, 1987).

Altruistic or helping behaviour is an example of behaviour that has been demonstrated to be influential on the action of observers. According to Lieberman (1993) researchers have found that people are more likely to donate money to the Salvation Army if they observe someone else make a donation. Equally, it is more probable that a motorist will help an individual with a flat tyre if they have observed someone else receiving help earlier in their journey. A more recent example illustrated that modelling is also a mechanism by which fear may be acquired. This study examined the influence of parental modelling on the acquisition of fear and avoidance responses of toddlers, toward novel but fear-relevant stimuli. Gerull and Rapee's (2002) results indicated that the toddlers showed more fear and avoidance to stimuli that their mother demonstrated a negative reaction too, then those that did not. Observational learning through modelling has further been demonstrated in research examining; alcohol, cigarette use (White, Johnson & Buyske, 2000) and aggressive behaviour (see Lieberman, 1993). For example, an original study by Bandura, Ross, and Ross (1961) examined the transmission of aggression through observation and imitation of adult models. Children were either exposed to aggressive or non-aggressive models. Results supported the notion that aggressive behaviour may emerge through imitation; the participants who were exposed to the aggressive models exhibited more aggressive behaviours then those who were exposed to non-aggressive models.

Studies have also identified that observational learning through modelling can be an effective way of teaching a variety of behaviours and skills. Not only is it effective for use with typically developing individuals, but also for individuals with developmental disabilities (Shipley-Benamou, Lutzker, & Taubman 2002). For example, Shipley-Benamou et al. (2002) report modelling has been used with disabled children in teaching appropriate play skills, language acquisition, symbol recognition, and motor skills development. The types of models typically used in the reviewed literature included, adult models (such as parents), and also peer models and self-models. According to Corbett and Abdullah (2005) the form of modelling used can include in vivo (real life), imaginative (mental rehearsal), and recorded (videotaped or filmed) (Corbett & Abdullah, 2005).

Peer modelling

The term peer modelling refers to a model that is roughly equivalent developmentally to the observer, and whose behaviour, verbalisations and expressions function as cues for the observer to attend to and potentially imitate (Schunk, 1987). Extensive research has documented the effects of peer modelling in vivo. For example, Rehfeldt, Dahman, Young, Cherrie and Davis (2003) taught a simple meal preparation skill (making a peanut butter and jelly sandwich) to adults with moderate or severe mental retardation using peers as the models. All three participants in this study mastered the meal preparation skill, demonstrated generalisation and maintained the skill at a one month follow-up. Peer modelling has also been used to facilitate the participation of children in childcare activities. Robertson, Green, Alper, Schloss, and Kohler (2003) found songs and finger plays, photographs of desired behaviour, and verbal cues (all peer mediated), were effective in increasing on-task behaviour, interactive play, and participation in circle and story time for two children with developmental delays. Carter, Cushing, Clark and Kennedy (2005) further indicate that research utilising peer mediated interventions in the classroom have played a role in increasing levels of active engagement, social interactions, academic performance, attainment of functional skills and decreasing problem behaviour for both individuals with and without disabilities. Other studies that have examined the use of peer mediated interventions include; Utley and Mortweet, (1997), Weiner (2005), Wert, Caldwell, and Wolery (1996).

Model characteristics

According to Buggey (2005), Dowrick (1999), Lieberman (1993), and Weiner (2005) certain characteristics of a model may increase the likelihood an observer will imitate the model's behaviour. Dowrick (1999) provides evidence that this applies to both typically developing individuals and other populations such as autistic individuals. It has been hypothesised that similarity between the model and the observed enhances the likelihood of imitation and thus behaviour change (Schunk, 1987). Schunk (1987) believes this is because model characteristics are often predictive of the functional value of behaviours, and that similarity to a model helps the observer determine the appropriateness of the behaviour and what the outcomes of imitating the behaviour might be. These

similarities according to Jesdale, Dowrick (1991), and Lieberman (1993), include; appearance and personal background, with the major contribution being behavioural similarity (Jesdale & Dowrick, 1991). Additionally, social status, warmth, friendliness, perceived power of the model (Lieberman, 1993) and similarities in gender and age (Buggey, 2005 & Weiner, 2005) are also significant characteristics that are likely to influence model imitation. Buggey (2005) further states researchers have found similarity in mood and level of functioning plays a role in the likelihood of imitation occurring. For example, Braaksma, Rijlaarsdam and Bergh (2002) undertook a study examining the effects of similarity in competence between models and observers (which were typically developing children) in relation to augmentative writing. The results of this study strengthen the similarity hypothesis. That is, learners who were deemed 'weak' learnt more from other weak learners, and learners who are deemed 'better' learners learnt more from 'better' models.

Self modelling

Self-modelling has been viewed as an extension of peer modelling (Dowrick, 1999). It is a procedure in which individuals observe images of themselves engaging in adaptive behaviour (Dowrick, 1999; Hitchcock, Dowrick and Prater, 2003). According to Dowrick (1999) "over 150 applications of self-modelling have been reported in print" (p 26.), and include *personal and social adjustments* such as anxiety, phobia's, depression, tantrums and self-help skills, *communication adjustment* such as, stuttering, social adjustment and assertiveness, *physical skills* such as, swimming, running and walking with prosthetic devices and *academic and vocational issues* including, selective mutism, classroom routines and writing. According to Dowrick (1999) self-modelling typically involves images being captured on video but asserts that other types of self-observation which are not typically referred to as self-modelling, clearly meet the definition. For example, audiotape, self-modelling in the imagination, the use of narrative media such as still photographs arranged in a series, role-playing or self-in-print (see below).

Imaginal self-modelling which is also referred to as mental rehearsal, has been shown to have positive but moderate results on skill acquisition, and

although it has been depicted as requiring less effort than other methods (such as video self-modelling), Dowrick (1999) says that it is believed to be "much less reliable and vivid" (p.24). Dowrick (1999) says "experts in the use of mental rehearsal have noted high individual variability in the skills of visual imagery and occasional rough elements, such as compulsive disaster imaging" (p 24). Exactly what Dowrick (1999) means by this is not clear, as further clarification is not provided. Walter (1995) like Dowrick (1999) notes differences in visual imagery ability have been documented, and Walter (1995) points out individuals who have done little or no imaging may find it difficult to accomplish mental practice. Several other variables are also thought to affect the successfulness of mental rehearsal. For example, the number of cognitive components the activity requires, whether the images are made multi-sensory and the individuals belief in the technique (Walter, 1995). Williams (2004) notes individuals must also have some amount of knowledge of and skill for performing the activity in order to be successful. Williams (2004) illustrates this with an example of his 7 year old son. Williams (2004) argues that not matter how much his boy mentally practices making a free throw he won't be able to make the free throw because he lacks the strength.

Picture prompts provide a sequence of photographs which show the participant engaging in the fundamental components of the desired activity. Self-in-print is a method that allows the reader to be the main character in instructional texts. Filling in their name and their families name into blank spaces in an already constructed story is an example of self-in-print. Pierce and Schreibman (1994) used a pictorial self-management strategy for teaching and maintaining daily living skills to children with autism. They found that autistic children could use pictures to self-manage their behaviour in the absence of supervision.

Self modelling sub classifications

A distinction between sub classifications within the self-modelling literature may be of importance when considering applications of the methods. Positive self-review (PSR) tends to involve video images (but can also include audio or pictorial techniques) of behaviour as fine-tuned examples of the best the individual has produced so far (Dowrick, 1999). That is; incentives and rehearsal are used to produce the best performance of the target behaviour, and errors and

distracting footage are edited out of the video. Also known as the "catch me being good and remind myself of it" procedure (Dowrick, 1999). Alternatively, feedforward (which can also encompass pictures, video and audio methods) can be used to teach skills; the only difference between this and positive self-review is that the skill has not yet been acquired or demonstrated in difficult environments (Dowrick, 1999). For the feedforward procedure components of skills that the individual already has can be edited together to depict the individual engaging in a behaviour that has not yet been achieved (Bellini and Akullain, 2007).

In a study using the self-as-model concept, Blum, Kell, Starr, Lender, Bradley-Klug, Osbourne and Dowrick (1998) used audio feedforward to treat several children with selective mutism. This example is supplied at this point for two reasons; to illustrate audio self-modelling as aforementioned, and to provide a clearer distinction between positive self- review and feedforward. Blum et al. (2002) had children answer several questions at home, in which the target person asking the question was the child's parents. An audiotape was then made of the child answering the questions. In addition an audiotape was also made of an individual whom the child was not talking to, asking the questions. The tapes were then edited together and played to the child; the audiotape sounded as though the child was answering questions from the target person with whom they did not usually speak. Treatment effects were established by the target person asking the same questions that were on the audiotape after the intervention had finished. Data collection consisted of noting the number of questions (which were asked by the target person) answered by the child. The authors found audio feedforward to be effective with this population. Participants increased the number of verbal responses to the questions following treatment, and verbal responses generalised to other individuals.

A review undertaken by Dowrick (1999) provides empirical evidence for the application of PSR and feedforward. Dowrick (1999) provides seven categories of self-modelling applications and assigns either feedforward or PSR to each category. Under each category Dowrick (1999) then provides multiple examples to exemplify each category and the effectiveness of each procedure. PSR was assigned to the following categories; an example to illustrate each category is provided. I*ncreasing adaptive behaviour currently intermixed with*

non-desired behaviour. PSR has been used to reduce disruptive behaviour and increase on-task or adaptive behaviour. *Improved images for mood-based disorders;* PSR has been used to demonstrate non-depressive behaviour. Participants are video taped talking about topics they find pleasant. During this taping lines of conversation that elicit positive mood are encouraged by an interviewer. The video tape is then edited and participants are required to watch the positive mood video. *(Re) engagement of disused or low frequency skills;* PSR has been used with women with medical conditions or disabilities to promote exercise. Videos much the same as commercial exercise videos, are constructed of the women engaging in exercise activities that they are currently undertaking at a low frequency.

Dowrick (1999) assigned feedforward to the following categories. Examples of each category are also provided. *Transfer of setting specific behaviour to other environments;* feedforward has been used successfully in the treatment of selective mutism. The participant's speech is recorded in a favourable environment and then edited into another context (i.e. a teacher's question). *Use of hidden support for disorders that may be anxiety based;* feedforward has addressed swimming performance of children with spina bifida. Physical support provided to the child is positioned out of view of the camera, and the video depicts the child showing mastery swimming skills in the absence of anxiety. *Recombining component skills;* feedfoward has assisted with challenging sporting activities such as gymnastics. Mastery components from different gymnastic routines have been edited together to produce a routine that an individual has not yet mastered. *Transferring role-play to the real world;* according to Dowrick (1999) both PSR and feedforward fit into this category. This category includes research that teaches; personal safety to the intellectually disabled, how to deal with socially challenging behaviours, anger management and sexual dysfunction. Dowrick (1999) points out that feedforward (the method used in this present study) produces greater behaviour change than positive self-review. Specifically, "it is usually better (there is a demonstrated greater likelihood of change) if the behaviour has not previously occurred" (Dowrick, 1999, p. 36).

Another subclass of self-modelling is feedback. According to Hitchcock et al. (2003) feedback "involves a review of past or current performance, including

errors or deficits. Thus, feedback may include a focus or discussion of errors in performance….. " (p.2). According to Dowrick (1999) there are at least two ways in which feedback can be effective. He says "it can serve as an assessment, including the observation of errors, leading to a different intervention (a strategy commonly used in couching sports). Or it can be structured to focus on examples of rarely achieved approximations to new skills" (p14). Most commonly feedback has been utilised in coaching sports and high-level sports competitions. However, Dowrick (1999) notes that sports programmes are beginning to use PSR more then feedback. This change may be due to the mixed results Dowrick (1999) notes have been found for video feedback as a behaviour change procedure. Dowrick (1999) also says that "seeing one's recent behaviour on video can be helpful, benign, or deleterious (especially if the content is emotionally loaded)" (p24).

There are several benefits to using the feedforward method over feedback. Firstly, individuals with disabilities and or special needs are often characterised by their limitations and not their strengths or capabilities (Davis, 2004). By utilizing feedforward attention to errors can be minimised and current and potential successes can be celebrated (Dowrick, Power, Manz, Ginsburg-Block, Leff, Kim-Rupnow, 2001). Bellini and Akullain (2007) assert that viewing positive as opposed to negative behaviour increases attention, motivation and self-efficacy. Many individuals with special needs have not acquired developmentally appropriate behaviour, therefore using feedforward the individual can view images of themselves engaging in adaptive behaviour that has not yet been achieved. Feedforward is also particularly desirable with special needs or disabled individuals as it does not prevent the use of support or assistance to complete the task successfully. Assistance, prompting and cueing can all be used to elicit the behaviour and later edited out. What is more less raw footage is needed with the feedforward approach (Bellini, 2006).

Video Modelling

Technological advances have permitted researchers to expand on the concept of modelling to incorporate the use of video to teach a wide variety of behaviours (Corbett, 2003; Jesdale & Dowrick 1991 & Sturmey, 2003). The video modelling (VM) technique involves the participant watching a videotape of a model engaging in a behaviour, which the participant later practices and imitates

(Corbett, 2003; Davis, 2004). Usually (with some variation) the child learner is required to sit in front of the television, pay attention to what is going on, is praised for staying on task and for paying attention to the television. Following the observation of the video vignette or segment the child is then asked to engage in, or mimic the observed behaviour, repeating this across trials and examples (Corbett, 2003).VM like other modelling types utilize peer, self or adult models (Apple, Billingsley, & Schwartz, 2005; Bellini & Akullian, 2007; Bellini, Akullian & Hopf 2007; Corbett & Abdullah, 2005; & Sturmey, 2003).

According to Sturmey (2003) VM can lead to a range of academic, social and language outcomes. VM can be used as a correction procedure and can promote stimulus control of appropriate behaviour without having to rely on prompts from others. Furthermore, VM may be utilised as an element of a package intervention (Apple et al., 2005; Sturmey, 2003) or as a stand-alone intervention (Jesdale & Dowrick, 1991). Other benefits of VM noted include; video being cheap, portable, and easy to operate with minimal instruction (Goldsmith & LeBlanc, 2004). VM also allows presentation of a range of examples and settings, and allows greater control in comparison to other procedures. In addition the video can be replayed, and consequently repetition of the same model is possible (Charlop-Christy, Le, & Freeman, 2000; Corbett, 2003; Krantz, MacDuff, Wadstrom & McClannahan, 1991). According to Krantz et al (1991) video modelling also appears to offer an alternative for those who have deficits in attention, videos can be used to display target behaviours in settings where they must eventually be demonstrated and they can be used to establish whole response chains (e.g., Murzynski & Bourett, 2007) and complex behaviours. VM can also be used to address generalisation deficits (Krantz et al., 1991), which is particularly important for individuals who find it difficult to transfer newly acquired skills to other settings (e.g., children with ASD). Rehfeldt et al (2003) believes that if VM can help individuals perform newly acquired behaviours in multiple settings then VM can ultimately help promote independence. Another advantage of VM is that editing makes it is possible to select the behaviours that are desired on the video and remove those that are not. VM can also be used to help individuals adjust to difficult environments (Dowrick, 1999). A variety of people can learn to use videotaping procedures

including parents and teachers, and this method can make learning fun (Cass, 2001).

Several examples illustrating the diversity of the use of VM are supplied by Corbett (2003), Jesdale and Dowrick (1991). According to Corbett (2003) VM has been used not only for social skills training, but also for parent training with children with conduct disorder, and as a means of providing instruction for speech therapists (Corbett & Abdullah 2005). Jesdale and Dowrick (1991) suggest six broad categories of VM applications. These categories are, professional training, social skills, children and parents, preparation for treatment, motor performance, and special populations; the latter of these categories being most applicable in relation to this thesis. The potential exists for additional categories to be established.

Video modelling and special populations

Special populations according to Jesdale and Dowrick (1991) are those individuals that may not have the opportunity to observe naturally occurring models, or that have unique learning needs. This population may include individuals with cognitive impairments, physical and developmental disabilities, and learning, emotional and behavioural disorders. There are many research studies utilising VM and the effectiveness of these procedures is well documented (Graetz, Mastropieri, & Scruggs, 2006; Krantz et al., 1991).

Video peer modelling (VPM) incorporates the use of peers to model the desired behaviour, and this is recorded and edited on video to be observed by the learner (Krantz et al., 2006; Sherer, Pierce, Paraedes, Kisacky, Ingersoll, & Schreibman, 2001). For example, VPM was used to help three adults with severe mental retardation acquire a domestic skill (making coffee) and an embedded social skill (making coffee and serving this to a peer). The participants were required to watch a video tape of a peer engaging in the desired behaviours and following the video they received praise if they too engaged in the required behaviour. The results supported the view that VM with a peer is an effective intervention for teaching a domestic skill. Two of the participants mastered the skill with 100% accuracy; the other received remedial training before performing with 100% accuracy. All 3 participants demonstrated generalisation across people, settings and stimuli (Bidwell, Rehfeldt, 2004). VPM has also been used to

facilitate generalised purchasing skills of 6 students with mild or severe disabilities (Haring, Breen, Weiner, & Kennedy, 1995).

According to Rehfeldt et al. (2003) adult models have also been used in VM procedures. However, Rehfeldt et al. (2003) do not provide any further information in regard to the use of adult models with disabled individuals. The references that are supplied by Rehfeldt et al. (2003) appear to be in relation to individuals with autism, but Rehfeldt et al. (2003) do not elaborate on this. A review of the literature did not find any studies using adult VM with individuals diagnosed with a disability (excluding autism). The use of adult video modelling in relation to autism is discussed later in this introduction.

Video self-modelling (VSM) is defined as an individual observing themself perform an adaptive behaviour on video (Dowrick, 1999; Graetz et al., 2006; Krantz et al., 1991; Sherer et al., 2001). The standard intervention for VSM is said to involve either capturing the behaviour in the natural setting or directly prompting the desired behaviour to be video taped (Davis, 2004).VSM has been documented across a wide range of settings, variables and participants (Dowrick, 1999; Graetz et al., 2006; Hitchcock et al., 2003). For example, Kehle and Gonzales (1991) list several successful studies undertaken with VSM, these studies examined; severe conduct disorder, disruptive and inappropriate behaviours in the classroom, selective mutism and personal safety. VSM has also been used to help reduce reading difficulties (Hitchcock, Prater, Dowrick, 2004) and stuttering (Bray & Kehle, 2001). According to Dowrick (1999) a large number of the VSM reports claim to demonstrate the effectiveness of VSM.

Davis (2004) undertook a study to establish the effects of an augmented self-model intervention with students with developmental disabilities, in relation to on-task and off-task behaviour. This study utilised a multiple-baseline across participant experimental design. Two female participants, diagnosed with cerebral palsy and seizure disorder, and their special education teacher were involved. The 2 participants were each videotaped in their classroom and the tapes were edited to source two 5 minute tapes per participant of on-task behaviour. The participants were then required to watch the video vignettes five times over the course of five days with their special education teacher. Davis (2004) obtained encouraging results, with both students increasing their on-task behaviour and decreasing their off-task behaviour.

A literature review undertaken by Hitchcock, Prater and Dowrick (2003) provides many references to studies that have utilised VSM with a variety of populations and behaviours. They reviewed VSM in relation to its use in school-based settings. The aim was to determine the extent to which video-self modelling has been used in school based settings, how it had been used, and the effectiveness of the method. Hitchcock et al. (2003) found 18 studies, out of 200 available, met their criteria for inclusion, and the populations used in these studies included a variety of disabilities (language, cognitive, behavioural, neurological, attention hyperactivity, or at risk of low academic achievement). Hitchcock et al. (2003) established the following from these studies; VSM can be successfully used in educational settings to support student behaviour, communication and academic performance, VSM can successfully increase the rate or frequency of behaviour and VSM is linked with reports of increased motivation and positive reports by teachers, students and parents. VSM studies have also shown intervention effects have generalised and maintained overtime.

Video modelling and autism

There are many challenges to treating individuals with autism, and therefore a variety of teaching methods need to be explored (Charlop-Christy et al., 2000). Due to the effectiveness of modelling procedures with various other populations, researchers have been lead to consider the utility of VM with individuals with autism, in hope that similar results will be found including, generalisation and maintenance of the behaviour change (Charlop-Christy et al., 2000).

According to the diagnostic and statistical manual (1994) autism can be characterised as a pervasive developmental disorder that has one or more specific abnormalities. These abnormalities may include; impairments in social interactions such as; impaired non-verbal behaviours, failure to join in on social games, share interests or develop friendships. Difficulties in communication include impaired language and communication skills; this encompasses deficits in eye contact, gestures and body posture. Other fundamental impairments include stereotypical and repetitive behaviours, inflexibility to routine changes, and a lack of creativity and imagination (Baron-Cohen, 1999; Baron-Cohen, Leslie & Frith 1985; Dempsey & Foreman, 2001; Harris, 2004).

VM has been used effectively to teach children with autism a wide variety of skills (Corbett, 2003; Corbett & Abdullah, 2005; Graetz et al., 2006). It is believed that VM may be particularly effective with individuals with autism as the video medium takes into account characteristic behaviour of the autistic individual (Corbett & Abdullah, 2005). For example, Graetz et al. (2006) suggest VM maybe most successful with individuals who learn visually and who find television motivating. Graetz et al. (2006) believe that individuals with autism seem intrigued by television and video, and Corbett and Abdullah (2005) provide reference to research that suggests individuals with autism "display an affinity for excessive television and video viewing" (p 5). Corbett and Abdullah (2005) provide several references to reports that indicate individuals with autism exhibit over selective attention, a restricted field of focus, benefit from visually cued instruction and show strengths in visual information in comparison to verbal. According to Corbett and Abdullah (2005) these reports provide a rationale for using visually cued instruction with individuals with autism. Furthermore, video does not require any social interactions or eye contact, and does not require the individual to focus on as many images as scenarios in role playing might (Corbett and Abdullah, 2005; Graetz et al., 2006). VM may also provide a novel way to learn new tasks (Corbett & Abdullah, 2005). Goldsmith and LeBlanc (2004) also suggest video can display clear and detailed behaviours, and videos can be replayed. As many of the features of the VM method capitalise on characteristics of the autistic individual, this might explain why VM has been shown to be more effective then in vivo modelling.

Bandura (1986) indicated observational learning involves four mediating processes; attention, retention, production and motivation. Corbett and Abdullah (2005) hypothesise that video supports these mediating processes in the following ways. *Attention*: the television and the monitor provide for a restricted area of focus, and subsequently increase the attention of individuals with autism by selectively focussing attention on pertinent stimuli. *Retention*: the ability to repeat the video of the target behaviour facilitates retention. *Production*: because VM is typically an active process, production of the observed behaviour through practice can take place. For example, in several studies after video viewing participants are required to engage in similar behaviour to those that are observed on the videotapes (Corbett and Abdullah, 2005). Lastly *motivation*: it is thought that

video/television is associated with leisure activities and therefore individuals maybe more receptive and enthusiastic about viewing video or television. Additionally, some researchers suggest children with autism find television naturally reinforcing and inherently motivating (e.g., Charlop-Christy et al., 2000; Corbett, 2003).

Video, adult modelling and autism

Several studies have been undertaken to assess the effectiveness of adult modelling using video with individuals with autism (Corbett & Abdullah, 2005). One example was the research undertaken by MacDonald, Clark, Garrigan and Vangala (2005). This study used video taped adult models to teach thematic pretend play to children with autism. The models were required to engage in scripted actions and verbalisations which were gathered from observations of typically developing children using three play sets. The type of play being taught involved long sequences of play behaviour and extended an earlier study. A multiple-probe design was used and results showed VM to produce extended sequences of scripted play. The acquisition of verbalisations and play actions were rapid and maintained over time. Notably, unscripted play did not emerge. Five other examples of video studies utilising adult models include D 'Ateno, Mangiapanello & Taylor (2003) who examined the use of VM to teach complex play sequences, Kinney, Vedora, and Stromer (2003) who used computer based video models to teach generative spelling, Charlop-Christy and Daneshvar (2003) who used VM to teach perspective taking, Charlop and Milstein (1989) who used VM in relation to scripted conversational exchanges and LeBlanc, Coates, Daneshvar, Charlop-Christy, Morris and Lancaster (2003) who used VM and reinforcement to teach perspective taking skills.

In comparison to in vivo modelling, adult VM modelling is thought to be more effective with individuals with autism (Charlop-Christy et al., 2000). Charlop-Christy et al. (2000) compared the effectiveness of in vivo modelling with VM for teaching developmental skills to children with autism. Using a multiple baseline design within and across the children, Charlop-Christy et al. (2000) found VM lead to faster acquisition than in vivo modelling, and intervention effects generalised across person, stimuli or setting (depending on the target behaviour) for a variety of behaviours (expressive labelling, independent

play, spontaneous greetings, oral comprehension, conversational speech, cooperative and social play and self help skills). Moreover, in all but one case, VM was found to be more time and cost effective then in vivo. Additionally, research undertaken to compare the effects of adult models with peer models for individuals with autism, suggests the latter are more effective (Apple, Billingsley & Schwartz, 2005). When considering the research mentioned earlier, this finding is not surprising, as peer models would likely possess more comparable characteristics to the observer than an adult model would.

Video, peer modelling (VPM) and autism

VPM has been used with individuals with autism to improve expressive and receptive language skills, facilitate social responsiveness, increase play behaviour and improve adaptive functioning (Corbett, 2003). Corbett (2003) also provides reference to several additional studies that have successfully used VPM with individuals with autism. These studies examine echolalia, social initiations, language discriminations, social skills and vocalizations of affection. Other studies using peer modelling include; Nikopolous and Keenan (2004a) who explored the effects of VPM on social initiation and play behaviours. This study used a multiple-baseline across participants design. Participants were required to observe a video tape of a peer and the experimenter engaging in social interactive play with a familiar toy. The authors state that both social initiations and reciprocal play skills were improved by the intervention and were sustained at follow-up. Similar results were also found in another study undertaken by Nikopoulos and Keenan (2004b). This study examined the effectiveness of VPM on social initiations and reciprocal play, and programmed for generalisation across settings and subjects. According to Nikopoulos and Keenan (2004b) VPM improved social initiations and reciprocal play for all the participants. Furthermore, the improved behaviour generalised across settings and subjects and maintained at both 1 and 3 month follow-ups. Corbett (2003) undertook research using VPM with an individual with autism. VPM was utilised to improve the perception of emotion, the video included four emotions; happy, sad, angry and afraid. The video was taken of a typically developing peer in play situations and social scenarios engaging in these emotions. The results indicated rapid and stable

acquisition of the four basic emotions, and maintenance of all the emotions was also evident.

Apple et al. (2005) assessed the effectiveness of using peer models to teach compliment giving initiations and responses (with embedded instructions). This study involved two experiments and used a multiple-baseline across participants design. In the first experiment they showed that VPM produced and maintained compliment giving responses, but not initiations. Initiations only occurred once reinforcement was added. Compliment giving responses and initiations maintained after video viewing was removed. Initiations appeared to be maintained by reinforcement and adult verbal monitoring. Once reinforcement was removed the number of initiations fell. In the second experiment they showed the inclusion of self-management strategies can be used to produce social initiations. There are several limitations to Apple et al.'s (2005) study. Apple et al. (2005) points out that in order to help the children track the rate of their initiations an adult had to be present during the first experiment. They also admit that it is possible to argue that the teachers may have served as discriminative stimuli for the children to initiate compliments. This study also failed to examine generalisation and fading of the self management system. Nevertheless, this study does show the potential VPM has for individuals with autism. Haring, Kennedy, Adams, and Pitts-Conway (1987) also undertook a study using VPM. This study investigated whether VM with explicit shopping training, could be used to facilitate the transfer of purchasing and social behaviours across various community stores (Bellini & Akullain, 2007). Haring et al. (1987) found that the combination of shopping training and VM supported the use of VPM with autistic individuals. The videotaped modelling promoted generalisation of purchasing skills from the training setting to a community store and results indicated increased independent functioning and social responding.

Gena, Couloura and Kymissis (2005) examined the effect of both in vivo and VPM on the behaviour of individuals with autism. The fundamental goals of this study were to a) change affective behaviour in both home settings and in the context of play activities and b) to compare the two procedures in vivo and VM. This study, which used a multiple-baseline design across participants, showed both procedures to be effective in increasing affective behaviour across three response categories (sympathy, appreciation, and disapproval). However, Gena et

al. (2005) stated that a comparison could not be made between the two treatments due to a small sample size. The videos in this example involved peer models rather then adult models and Gena et al. (2005) utilised reinforcement contingencies which Charlop-Christy et al. (2000) did not. Subsequently, not only did the study fail to provide evidence for faster acquisition of affective behaviour in one treatment over the other, it is difficult to separate the effects of the two procedures from the combined effects of the procedures; the reinforcement and prompting used. It is apparent research is still needed to determine empirically whether in fact VPM is superior to in vivo modelling.

Video, self modelling and autism

It has been reasoned that the self would make an extremely powerful model as it would provide ultimate similarity (Davis, 2004; Dowrick, 1999). Furthermore, the procedure which utilizes the self as the model is thought to provide the essential elements of self-efficacy (Bandura, 1986). Bandura (1997) believed the benefit of seeing oneself perform successfully is that it not only provides unambiguous information on how best to perform the skill, but also the belief in one's own capacity is strengthened. Similarly, learning through self-observation is also consistent with other theories including learned optimism (Dowrick, 1999), classical and operant conditioning theories of learning (Dowrick, 1999; Hitchcock, Dowrick & Prater, 2003), socio-cultural views of learning and language development and Vygotsky's zone of proximal development (Hitchcock et al., 2003).

According to Buggey (2005) there are two types of VM using the 'self' that can be undertaken. One involves the use of role-play or scripts to get the person to engage in the behaviour, the other involves recording behaviour over time and then editing the tape so that only exemplars of the behaviour are present. According to Buggey (2005) the latter is better with individuals with autism as they find it difficult to role-play. Previous research using VSM has shown promising results with children with autism (Buggey, 2005; Graetz et al., 2006; Jesdale & Dowrick, 1991). For example, Buggey (2005) assessed the use of VSM with individuals of varied ages diagnosed with autism in a school setting. The target behaviours included language, aggression, tantrums, and social initiations. A multiple-baselines design across students and behaviours was utilised and no

additional procedures such as reinforcement were recorded as being employed. The results paralleled other research, and indicated success across all the behaviours and with all the participants. Moreover, teachers and assistants involved with the participants made encouraging comments about the procedures. For example, the intervention was non-intrusive, positive images were utilised and no teaching time was missed.

Another study showed that VSM was a promising intervention for teaching spontaneous requesting (Wert & Neisworth, 2003). Four participants took part in this study and adult prompting and other strategies where used to produce spontaneous requests. For example, spontaneous requests included asking for an object. Videotaped footage included only positive behaviour; prompting and negative behaviour was removed. The procedure utilised was a multiple-baseline across participants and the videotapes included multiple examples of request behaviour. The results of this study showed that VSM increased the number of spontaneous requests made by these participants. Maintenance data were also collected for 3 of the 4 participants and indicated participants maintained a high frequency of spontaneous requests.

Buggey, Toomes, Gardener and Cervetti (1999) examined self-modelling with autistic individuals to analyse the outcomes of using VSM on the attainment and maintenance of appropriate verbal responses to questions. Three participants took part and a multiple baseline design across participants was used to assess performance. The results indicated that all participants increased their verbal responses, with the mean percentage of appropriate responses doubling from baseline to intervention for all participants. Furthermore, two parents who were blind to what the study entailed reported positive changes in relation to language and socialization. Likewise, Bellini et al. (2007) found positive results when examining the effectiveness of VSM on increasing social engagement of autistic children. Bellini et al. (2007) found that VSM dramatically increased unprompted social engagements; that these increases occurred rapidly after video intervention and maintained after VSM was withdrawn.

According to Dowrick (1999) observing one self in comparison to observing someone else performing the same task, produces a different reaction. Dowrick (1999) proposed that an individual takes more notice of an image of themselves, particularly if the behaviour is one that is valued, and that such

images produce a source of self-belief. In contrast, less attention and a weaker source of self-efficacy is thought to apply when using an image of someone else. This implies that VSM would in fact be more effective then video peer modelling. Furthermore, past research suggests that increased similarity between the observer and the model increases the likelihood of imitation and thus behaviour change. A self-model would seem to reflect ultimate similarity.

Video modelling and video self modelling

Recently a meta-analysis of VM and VSM was undertaken by Bellini and Akullain (2007). This analysis examined whether VM and VSM met the criteria for evidenced-based practice. Intervention, maintenance and generalisation effects were examined across three groups of dependant variables (social-communicative skills, functional skills and behavioural functioning). Bellini and Akullain (2007) found moderate intervention effects for VM and VSM, and that the effects of both methods generalised and maintained across all three groups of dependant variables. A number of limitations and future research suggestions were provided by this meta-analysis. Four of particular relevance here are; 1) Many of the studies combined VM with other therapeutic strategies and few examined VM and VSM alone. 2) Three out of the four studies that scored the lowest intervention effects combined VM and VSM with other intervention strategies. 3) Further research is warranted to examine VM and VSM in the absence of other intervention modalities, and to examine differences between VM and VSM. 4) Measures of intervention fidelity (attention to video, social validity and enjoyment) should be considered in VM and VSM research.

Similar to Bellini and Akullain (2007), a review by Delano (2007) indicated most VM studies showed positive gains in the target behaviour, its maintenance and generalisation. However, five out of the 19 studies (typically using 'other' as the model) showed mixed results. One of these studies was a study undertaken by Sherer et al. (2001) which examined VPM with VSM (see the following section). Interestingly, both Bellini, Akullain (2007) and Delano (2007) found that although most studies highlight the benefits of VSM, there were in fact very few VSM studies carried out, and many of those were conducted by the same researchers. Delano (2007) also suggested the need for further research and for measures of treatment fidelity.

Video modelling and autism 'peer' versus 'self'

The comparative study undertaken by Sherer et al. (2001) asserted to evaluate 'self' versus 'other' VM. However, it can more accurately be described as a comparison of 'self' versus 'peer'; the models 'other' were in reality, typically developing peers who were matched on chronological age and gender. The study intended to not only compare 'self' versus 'other' but also to investigate characteristics that might be associated with positive treatment outcomes. Five participants took part and all were trained to answer a series of questions across both conditions; some questions were also counterbalanced between participants (a question used in the peer condition for one participant was used in the self condition for another). The target behaviour was conversation skills and a set of 20 questions were compiled for each child based on questions the child's parents valued and from baseline assessments. Baseline assessments determined those questions that the participants could not answer. Questions concerned the child's home or school life, and eight questions were assigned to both self and other, the last four questions were used as generalisations probes. Verbal prompting and cue cards were used to elicit responses to questions for taping in the self condition, and were edited out for the intervention. The peer model was required to rehearse the questions and answers with the therapist. The design used was a mixture of a single participant multiple baseline and an alternating treatments design. Following, both baseline (all 20 questions were asked) and video production, Sherer et al. (2001) had the therapist ask the child the 20 questions to measure any acquisition effects of making the tape (post-video production). The results of the post-video production showed that only 1 participant increased responding following video production, the other 4 showed no change. The overall results of the intervention were variable between participants. Two participants responded well and quickly to both video conditions, 1 more slowly, and the remaining 2 never reached the criterion in either condition. According to Sherer et al. (2001) 3 out of the 5 participants reached the criterion of 100% accuracy at post treatment. However, an examination of the results shows that only 2 participant's reached 100% accuracy for both conditions while the other participant reached this criterion only for the condition 'other'. Sherer et al. (2001) maintain that the study shows that, overall, using either method (self or other) is equally as effective.

This conclusion seems rather perplexing. How can Sherer et al. (2001) claim there is no difference between the two methods, or even that they were generally effective, when 2 participants failed to reach criterion on both conditions and a 3rd on one condition. A data table supplied by Sherer et al. (2001) provided the following information in relation to VM preference. Luke was said to prefer the condition 'other' as the criterion was never reached for the 'condition self'. Sam preferred the condition 'self' reaching the criterion in 2 trials in comparison to 14 for the condition 'other'. Joey was deemed to have no preference as the criterion was never reached for either condition. Jack also did not have a preference for either condition; this was because the criterion was reached in a similar number of trials across both conditions. Chuck was also considered to have no preference as the criterion was never reached for either condition. On examination of these findings it is apparent that out of the 10 possible times over both conditions that VM could have been effective, it was only effective on five. From this analysis it seems hard to establish any firm conclusions as to whether VM in general is effective. It also seems difficult to draw definitive conclusions when determining the most preferred VM procedure. According to Sherer et al. (2001) 2 participants never reached the 100% criterion, Sherer et al. (2001) claim this indicates that 2 participants did not a have a preference for one condition over the other, and their preference is labelled as 'none'. Additionally, this label (none) is also given to a 3rd participant who reached the 100% criterion at a similar rate across the two VM conditions. The label 'none' was assigned when the rates of acquisition was similar between conditions. Yet, because 2 participants never reached criterion on either method, possibly 'inconclusive' or 'ineffective' seems a more fitting label than 'none'. It seems fair to assign the label 'none' for the participant who reached the criterion similarly for both conditions, but the label 'none' represents something quite different for the other 2 participants who never reached the criterion.

Additionally, Sherer et al. (2001) proposed that differences may be due to visual learning and visual memory differences. It was suggested that the 2 participants with the highest performance levels had both a preference for visual stimuli and extraordinary visual memories. However, such suggestions are both speculative. These observations were made by the parents of the participants and no data was collected to confirm this. Sherer et al. (2001) also hypothesised that

failure to find differences between conditions may be due to the target behaviour chosen. They suggested that conversation may be an acquisition behaviour which can be learnt via either method (VSM & VPM). What they meant by 'acquisition' behaviour is that conversation may be a new behaviour incorporated into an individual's repertoire. They suggests that in the case of altering an already existing aberrant behaviour, self-modelling may be more effective. They illustrate this with a case of a hyperactive boy. It is suggested that VM is more likely to be effective if the boy watched a videotape of himself engaging in less hyperactive behaviour then if he watched another child play quietly. Watching a videotape of someone else engaging in less hyperactive behaviour might not work as effectively as watching a video of oneself, but perhaps this is because the behaviour of the peer would seem out of context. If one considers the different forms of VM (feedback vs. positive self-review) this problem could possibly be circumvented. Using feedback which incorporates both the positive behaviour (playing quietly) and negative behaviour (behaving hyperactively) could be used with either the 'self' or the 'peer' model. Feedback would allow the behaviour of the peer to be in context. Therefore, a comparison could be made between both conditions 'self and 'peer' with aberrant behaviour. It is possible that self-modelling and peer modelling (in the case of aberrant behaviour) might be equally effective when using feedback.

Currently, no research has been undertaken to establish which the more effective method is; feedback or positive self-review, nor has research given consideration to whether the behaviour is acquisition behaviour, low rate behaviour or an aberrant behaviour. Consequently, further research needs to be undertaken to clarify these observations and to determine if in fact VSM and VPM are equivalent.

Purpose of this study

There are several reasons why it is deemed important to compare 'self' modelling with 'peer' modelling. Clearly, it is important to determine which intervention configuration produces the best outcome to maximise treatment success. It is also important to replicate research to ensure that a substantial amount of evidence is obtained before claiming a method is effective. The more studies that produce similar effects, the more confidence can be placed in the

studies findings. Furthermore, it is apparent more research is warranted too; determine differences between the video modelling methods and to examine VM in the absence of other intervention modalities.

Additionally, there are appealing arguments for each treatment method. According to Sherer et al. (2001), using peers in VM has the advantage of being faster and easier then using self models as it may be more difficult to obtain successful performance from the individual with a disability then a peer. Furthermore, clinicians and researchers could share the resources by making them publicly available as purchasable collections of video tools (Goldsmith & Le Blanc 2004). VM can also be utilised by teachers and parents without needing the assistance of other professionals. Multiple models could also be utilised and might assist with generalisation. There are also arguments for why the 'self' as model may be a more effective method. For example, it is suggested that children may enjoy watching a video of themselves more then a peer, and that the use of the self as a model may make learning and visual processing easier (Sherer et al., 2001). Possibly, it may also be easier and less time consuming for parents to use the 'self' model rather then search for an age appropriate match.

Given the amount of empirical support available for the efficacy of VM methods with autistic individuals, but the lack of evidence to distinguish the best configuration of this method, the aims of this study were to; a) attempt to reproduce the overall findings that using VM is an effective intervention technique for individuals with autism, b) to compare the effectiveness of 'self' versus 'peer' video modelling in the absence of other intervention modalities and c) to add to the growing literature on VM and autism.

Methodological considerations

According to Poling, Methot and LeSage (1995) the fundamental element to a powerful experimental design is to manage conditions so that the data obtained provides a convincing display of the possible effects of the independent variable on the dependant variable. Consideration should be given not only to the design of the experiment, but to a number of other methodological considerations. Including; experimental variables, experimental criteria and extraneous variables.

For the purposes of this experiment, elements from two experimental designs were utilised; the multiple baselines design and the alternating treatments

design. The advantages of combining both designs are numerous. Firstly, Poling et al. (1995) state that good experiments bring together elements of two or more specific designs, as opposed to ensuring the design is denominated by a conventional name. Secondly, a multiple baseline design was utilised, as the research question did not permit the use of other types of experimental designs such as the ABA experimental design. The multiple baseline design can be used across behaviours, settings and participants without having to withdraw treatment (Copper, Heron and Heward, 1987; Tawney & Gast, 1984). This design can also establish when changes in behaviour may not be attributed to the treatment. The multiple baselines design is not limited by the shortcomings of the withdrawal design. That is; it is appropriate for evaluating treatments such as modelling which has irreversible effects, and does not require counter therapeutic changes (Poling et al. 1995). However, the multiple baselines design is not suited for evaluating interactions, comparing interventions or examining multiple values of an independent variable (Poling et al., 1995). In order to compare behaviour change between participants, and to compare treatment effects, a combination of this design and the alternating treatments design was deemed most appropriate for the purposes of this thesis. The alternating treatments design according to Tawney and Gast (1984) is the most practical intervention design for comparing treatments. This design is useful in the analysis of highly variable behaviour, can be used regardless of participants behaviour and a comparison can be made between performances on two conditions. This design allows for early initiation in treatment, rapid exposure to all conditions and quick evaluation (Poling et al., 1995). According to Copper et al. (1987) and Tawney and Gast (1984) sequence effects and the problem of irreversibility can also be minimised.

Strategies to minimise extraneous factors were also deemed important. This included; randomised stimuli presentation (placement of pictures, order of story and question types) and randomised condition selection for each peer. According to McBurney (2001) random assignment is a powerful control method. Notably, randomised condition selection was utilised for each peer of participants not for each individual. Participants were first matched with another participant before randomised placement. Matching according to McBurney (2001) can also improve experimental precision. There were three main reasons both randomisation of pairs into a condition and matching of participants for this

pairing were used. First, matching was considered important as the self video of a participant needed to be used as a peer video for another participant. This participant needed to be of similar ability to increase the likelihood the models behaviour will be imitated (Buggey, 2005; Jesdale & Dowrick, 1991; Lieberman, 1993; & Weiner, 2005). Matching meant that pairs could then be put in opposite conditions so that the opposite stimuli could be presented in the peer video. Second, the participant that was used in the peer video needed to be from the same school so that settings in the peer videos were identical. Third, randomisation of pairs into the conditions was used to increase face value of the experiment. In other words, to prevent readers assuming the researcher had any bias toward one condition over the other.

According to Dowrick (1999) shorter 2-5 minute vignettes are more typically utilised in studies then longer vignettes. This is because past studies have indicated the longer vignettes can be too long-lasting for participants (Dowrick, 1999). Hence, shorter vignettes were presented to participants in this thesis. Additionally, Apple et al. (2005) suggested that targeting less behaviour at one time will allow children with autism to have a greater success in acquiring new behaviour repertoires. Thus, only one target behaviour was trained per participant in this thesis.

Performance criteria and acquisition effects due to video production were also important to consider in this research. Past research was consulted for setting the performance criterion, and this was set at 80-100% correct across two consecutive sessions. For example studies included Charlop-Christy et al. (2000), Macdonald et al. (2005), Sherer et al. (2001), Wert and Nesworth (2003). In relation to acquisition effects, Sherer et al. (2001) used another individual not associated with the intervention to make the peer videos. Therefore, acquisition effects could be tested for each participant individually. This study used the self video of one participant as a peer video for another, and consequently all videos needed to be constructed simultaneously. Subsequently, to test for acquisition effects baselines were extended for all participants (post video phase).

According to Copper et al. (1987), “if a behaviour change is to be truly worthwhile and effective, it must last and be useful to the individual in different settings and in various ways” (p.553). If these expectations are met, behaviour change is said to have generality (Cooper et al., 1987). Accordingly, Martin and

Pear (2003) say that learning would be of limited value if an individual could not generalize stimuli. This is because we would have to learn all over again every time the situation changed. It is deemed important to determine whether the participants of this study generalised any behaviour changes for three reasons. First, the behaviours trained in this study would typically be performed by the participant in different settings, with different people, and for different stimuli then were used in this study. It would be of limited value to the participant to produce behaviour changes that could not be used in the participant's natural setting. Second, in terms of research, testing generalisation informs specialists about the value of the training method. Third, Drabman, Hammer and Rosenbaum (in Cooper et al., 1987), point out there are ethical reasons for considering generalisation. They say "a question arises concerning the ethics involved in soliciting the cooperation and trust of those in need of professional assistance without attempting to discover methods to prevent beneficial treatment effects from disappearing when the behavioural program is withdrawn" (p.555). Due to time restraints and teacher availability, generalisation probes had to be tested on three dimensions at once; stimuli, person and setting. This meant if generalisation was unsuccessful, it would be difficult to determine why generalisation failed. Nonetheless, there was more merit to testing generalisation across all dimensions at once then not at all.

Martin and Pear (2003) argue that a follow-up phase should be incorporated into behaviour programs. This follow-up phase allows the maintenance of any gains achieved during intervention to be assessed. According to Martin and Pear (2003) if improvements achieved during treatment are not maintained after its termination, then the problem has not really been solved. For this reason, it was deemed desirable to include a follow-up.

According to Bellini, Akullain (2007) and Cooper et al. (1987) intervention fidelity (or procedural reliability) is another important factor that should be measured in research studies; but typically is not. Intervention fidelity helps establish whether the intervention was employed as intended. Specifically, determining whether the independent variable is applied over the course of the research as described in the method section (Cooper et al. 1987). Bellini, Akullain (2007), and Cooper et al. (1987) point out that attention and motivation are both crucial to observational learning; thus documenting participant attention to the

videos and participant enjoyment of the videos is essential. Subsequently, this thesis made brief informal observational notes, recorded all sessions and required the camera assistant and researcher to fill out a fidelity questionnaire.

Inter-observer agreement was also regarded as an important element to consider. Some of the functions inter-observer agreement serves include; assessing definitions to identify whether they are replicable by others, assessing whether definitions were used accurately, and determining if the experimental effects were believable (Copper et al., 1987). As a minimum standard inter-observer agreement is calculated at least once per condition, however it is ideal to assess this agreement more often (Copper et al., 1987). Therefore, it was decided that assessment should take place for at least 30% of each phase and condition.

Method

Participant recruitment

Ethical approval for this research was gained through The University of Waikato, Department of Psychology, Research and Ethic's Committee. Recruitment of participants involved a letter (Appendix A) being given to the principal of the selected school. This letter explained the university regulations regarding seeking participants, and the principal was asked to read supplementary information to assist him in his decision making. This supplementary information included a checklist (Appendix B) which outlined prerequisite skills for participation, a list of potential target behaviours (Appendix B) and an information sheet answering possible questions (Appendix C). A meeting was held with the principal to answer questions and to supply letters (Appendix D), consent forms (Appendix E) and information sheets to potential parents (Appendix F). A reminder letter was also written for the parents/caregivers of potential participants. This reminder letter was written because the school holidays coincided with recruitment, it was thought that this time period may have been the reason for the small amount of responses from parents/caregivers wishing to participate in the study (Appendix G). On receipt of the consent forms or acknowledgement of interest, parents were contacted over the phone. Parents were given the option of either discussing the research over the phone or in person. As participants were under 16 years of age, informed consent was obtained from a parent in written form prior to inclusion in the research.

Participants

Six children with autism participated in this study; 2 girls and 4 boys. Five participants had previously received a diagnosis of autism and one of pervasive developmental disorder with autistic tendencies. Additionally, as a reliability measure, the researcher and the participant's teacher rated all participants on the Child Autism Rating Scale (CARS). P2 and P4 scored in the mild to moderately autistic range, with the researcher scoring the participants at 31.5 and 31 and teacher scoring the participants at 33 and 32.5 respectively. The remaining 4 participants scored in the severely autistic range. According to the researcher P1 scored 44, P3, 43; P5, 48 and P6, 48.5. The teacher ratings were; P1, 48; P3, 44.5; P5, 52; P6, 52.5 .The age of participants ranged from 5-9 and the mean age of

participants was 7.5. Secondary diagnoses for participants included, intellectual disability, cerebral palsy, partial deafness and developmental delay. P5 and P6 were both non verbal. P2 and P4 attended a satellite class at a normal public school and P1, P3, P5 and P6 a special needs school.

Selection of target behaviour

Selection of target behaviour involved two steps. First, a checklist of target behaviours (Appendix B) were constructed from a review of past research that used video modelling (see Sherer et al., 2001; Charlop-Christy et al., 2000, MacDonald et al. 2005, D'Ateno et al., 2003, Rehfeld et al., 2003 and Shipley-Benamou et al., 2002). Second a semi structured interview (Appendix H) was undertaken and a checklist completed with parents and teachers (the parental interview for P5 was conducted prior to the study whilst the teacher interview took place after research as the student was a new entrant and at the start of the study and was therefore unknown to the teacher). The semi structured interview asked two sorts of questions. One about prerequisite skills and the other about target behaviours the participant could or could not perform. The target behaviours of most importance to the teacher and the family were highlighted. The two target behaviours of most importance to four of the families included oral comprehension and conversation skills. However, for the purposes of this study oral comprehension was chosen over conversation skills due to time restraints. Emotional recognition (as opposed to emotional expression) was selected for the 2 remaining participants as they were both nonverbal.

Experimental assistant

To prevent static frames which would have resulted from using a tripod, a video recording assistant was employed for this study. Static frames were deemed undesirable because a stationary position of the camera would have meant only one angle could be captured and important information would have been lost. The assistant was recruited via an advertisement in The University of Waikato Psychology and Media Departments (Appendix I). The film assistant recruited was a film and media graduate student.

Setting:

Due to limited space a range of small rooms were used during this study with P2 and P4. All rooms had a table and chairs and were isolated from other students and teachers, so as to prevent distraction. For the remaining participants the schools therapy room was used, which also contained a table and several chairs. Generalisation probes for P2 and P4 were undertaken in a seated area outside the new entrant classrooms and in the school playground for the remaining participants.

Materials:

The University of Waikato supplied a Sony video recorder DCR-TRV340E and a Dell laptop (model PP02X). The video recorder was used to video each participant's session and for taping the footage that was later edited for the intervention videos. The laptop came with Windows Movie Maker which was used for editing the video footage into modelling tapes. The laptop was also used during intervention phases to play the intervention videos to the participants. During Intervention 2, as a form of reinforcement, PC games were played on the laptop.

Five, three sentence stories were constructed for the oral comprehension component of this study; four for baseline and intervention, and one for generalisation probes. Additionally, four questions were complied for each story; the four questions were WHAT, WHERE, WHY and WHEN questions (see Table 1 for an example) and these were scripted into a story and response schedule. Data collection sheets were used during all phases of the oral comprehension component (Appendix J).

Six different emotions were selected for the emotional recognition component; scared, sad, angry, happy, disgusted, surprised, and afraid. Four series of each of these emotions were used. That is; four different people's faces were used expressing each of the six emotions. In addition each series was divided into Set A or Set B. Set A included; happy, scared and disgusted expressions and Set B; sad, surprised and angry. These pictures were printed and laminated onto 13cm x 9cm cards (Appendix K gives an example set). Additionally, a 45cm x 60cm cork board was used to present the pictures to participants. A data collection sheet was also constructed for this component (Appendix L).

Design:

A multiple baseline and an alternating treatments design were used, in which participants received each treatment condition on alternating week days. That is; the treatments (peer vs. self) were alternated on different days. One session occurred per day. Four participants were in the oral comprehension condition and 2 were in the emotional recognition condition. The two groups of participants (oral comprehension and emotional recognition) were treated individually; baselines of each group were treated separately from each other. Feedforward (see introduction) was the VSM design utilised in this thesis.

Table 1: *Example of a three sentence story and the four associated questions provided in the story and response schedule.*

Three sentence story: It was Saturday morning and Thomas the Tank Engine was feeling very excited. Thomas was very excited because he got to visit is good friend James at the new train station. Thomas was allowed to visit James once he heard the fat controller blow his whistle.	
Questions	**Correct responses (response schedule)**
Q: **WHEN** could Thomas visit James? A: Once he heard the fat controller blow his whistle	Once he heard the fat controller blow his whistle When the fat controller blows his whistle He hears the fat controllers whistle Once the fat controllers blows his whistle He hears the controllers whistle He hears the whistle
Q: **WHY** was Thomas feeling very excited? A: because he got to visit James	Because he got to visit James He got to visit James Because he could see James He could see James Because he could visit James Because he's excited to visit/see James
Q: **WHAT** day was Thomas feeling very excited? A: Saturday Morning	Saturday morning Saturday
Q: **WHERE** did Thomas get to visit James? A: At the new train station	At the new train station At the train station The train station

Procedures:

Baseline:

During baseline participants 1-4 were individually taken to the experimental room by the experimenter and were seated at a table facing the

experimenter. Once the participant appeared to be paying attention, one of the four three sentence stories were read to the participant. After the story, the participant was then asked one of the four questions (WHAT, WHEN, WHY, WHERE) associated with the story. Stories and questions were asked at a slow pace with no intentional intonation. Following a correct (C), incorrect (IC) or no response (NR) from the child, the next question was then asked. The time between each question was approximately 3-5 seconds. After all four questions about the story were asked, an unread story was then read. The participant was then asked the associated questions. This process continued until all four stories were read and all their associated questions were asked. This process meant a total of four stories were read and16 questions were asked, four of each question type. For 1 participant a short game was initiated between each set non contingent on prior responses.

Participants 5 and 6 were taken individually to the experimental setting and were seated facing the experimenter. Once the participant appeared to be paying attention to the experimenter, pictures from either Set A (HAPPY, SCARED, DISGUSTED) or Set B (SAD, SURPRISED, ANGRY) from one of the series (one of the three people depicting the emotions) were presented to the participant. The three pictures were presented on a cork board and the pictures were presented in the shape of a triangle (two pictures on top, one underneath). Positions of the pictures were presented randomly along with the series described above. Participants were asked to "touch the picture with the happy (sad, scared, angry, disgusted or surprised) face" depending on which set (A or B) was presented. After approximately 3-5s the participant was asked to touch one of the remaining untouched pictures from that set. For example if the participant was asked to touch the happy face from the Set A, then the participant would be asked to touch either the scared or disgusted face. After 3-5 seconds the participant was then asked to touch the last untouched picture. Pictures were then removed and another series or set was presented. The same process continued until both sets and all three series were shown. In total two sets of emotions were shown to each participant (six emotions) and three series (three different people depicting each of the six emotions). In total the participant was asked to touch 18 pictures. An unrelated task (blowing bubbles, handclapping, Simon says) was also used non-

contingent on responses after three series. Session times for both target behaviours were approximately 10-20 minutes long.

Video production for Oral Comprehension:

The four questions WHAT, WHERE, WHY and WHEN were divided into two sets; one set contained the WHAT and WHERE questions and the other set the WHY and WHEN questions for all four stories excluding the generalisation story. Participants were then paired based on ability and gender. Pairings were; P2 and P4, and P1 and P3. The participants in each pair were then allocated randomly into opposite sets for each condition. Table 2 shows P2 had the WHAT and WHERE question set for the self video condition and the WHEN and WHY question set for the pair condition. Consequently, P4 had the WHEN and WHY question set for the self condition and the WHAT and WHERE for the pair video condition.

Table 2: *The type of questions used for P1-P3 for the peer and self videos*

Matched Participants	**Condition 1 (Peer Video)**		**Condition 2 (Self Video)**	
P2	Why	When	What	Where
P4	What	Where	Why	When
P1	What	Where	Why	When
P3	Why	When	What	Where

The researcher was then video recorded reading each individual story and asking the four questions (WHAT, WHEN, WHY & WHERE) associated with that story. This was undertaken in the rooms that were used during baseline; participants were not present during this time. Stories and questions were only asked once in each setting, thus the same recording could be used with participants who attended the same school. Participants were then brought into the appropriate room and asked to repeat the answers to the questions associated with each story. These answers were for the "self" condition only. Answers were broken up into small phrases or single words if necessary. For example, for the response "to the dairy" the participant may have been prompted to say "to-the-

dairy". For all participants the entire session was video recorded. The recordings of the researcher reading the stories and asking the questions were then edited together with each participant responding correctly to their question set and all prompting was edited out. Subsequently, the video looked as though the researcher was reading each story, asking each question, and the participant was providing the correct responses.

The peer video did not need to be created as the self video of the participant's pair was used. For example, the self video made for P2 which asked the WHAT and WHERE questions, were used as the peer video for P4. The self video made for P4 which asked the WHY and WHEN questions, was used as the peer video for P2. Video vignettes for this target behaviour ranged from 2.24 to 2.39 minutes.

Video production for emotional recognition:

Table 3 indicates the emotions P5 and P6 were allocated for this component. Video production involved the researcher being recorded (the participant was not present) asking the participant to touch a particular picture. The phrase used was "can you touch the picture with the….face". This was done only for the self condition stimuli. This phrase was repeated for all three pictures, and then another series from that set was presented. That is; P5 was asked to touch the HAPPY, SCARED and DISGUSTED faces from each series (excluding generalisation). Following this recording the participant was brought into the same room and the researcher prompted the participant to touch each picture in each series. The phrase was never used during this time to prevent prompted learning. Prompts involved the target picture being turned on an angle. After the video of the participant was made, the two videos were edited together, to appear as though the researcher asked the participant to touch a picture and the participant responded correctly. Peer videos did not need to be constructed; the self video constructed for P5 was used as the peer video for P6 and the self video for P6 was used as the peer video for P5. Video vignettes for this target behaviour varied between 2.10-2.25 minutes.

Table 3: *Emotions allocated to P5 and P6 for the self and peer videos*

Participant	**Condition 1 Self Video**			**Condition 2 Peer Video**		
P5	Happy	Scared	Disgusted	Sad	Surprised	Angry
	Set A			Set B		
P6	Sad	Surprised	Angry	Happy	Scared	Disgusted

Post Video Making:

The post video making phase used the same procedures as in baseline.

Video Modelling:

This phase involved participants being shown each video vignette on alternate week days. Participants were seated in the same room as in baseline and were prompted to watch either the self video or the peer video (dependant on the previous days viewing). Videos were shown twice during each session and verbal praise was given only for paying attention to the video or for sitting correctly. Following video presentation the participants in the oral comprehension condition were read the four stories as in baseline, followed by the associated questions. For example, if P2 was shown the self video vignette he was asked the WHAT and WHERE questions for each of the four stories (refer to Table 2). The following day this participant was shown the peer video and asked the WHY and WHEN questions for each of the four stories.

The procedure was similar for the participants in the emotional recognition condition. However, these participants were shown the pictures of the emotions associated with the video they had just watched. They were then asked to "touch the picture with the ….face". For example, during the self video phase P5 was asked to touch the pictures from Set A (happy, scared and disgusted). The following day this participant watched the peer video vignette and was asked to touch the pictures from Set B (angry, surprised and sad). Following video watching and questioning all participants had access to toys which were supplied non-contingent on the responses given.

Generalisation

A teacher or teacher aid was used to test for generalisation in probe sessions. The teacher/teacher aid was trained to score responses and to read the generalisation stories without intonation. The teacher/teacher aid was supplied with the story and response schedule described earlier (Table 1 provides an example). Generalisation probes were taken during each phase of the study and covered person (teacher or teacher aid), setting, and story (oral comprehension) or series probes (new person expressing the six emotions). Generalisation probes were conducted on separate days from the VM sessions. Each generalisation probes included all three dimensions and each was approximately 5-10 minutes long. No intentional feedback or prompting was provided and toys were not available following generalisation (this reduced the amount of time the teacher/teacher aid spent away from the rest of their class). Generalisation probes were only tested across all of the experimental phases for 4 participants. This is because one of the teacher aids was unavailable during both intervention phases for one participant and one participant could no longer participate in the research.

Scoring:

All sessions were recorded on videotape. Correct responses (C) were defined for oral comprehension a priori through the story and response schedule (see Table 1 for an example). Responses were deemed correct if participants gave a correct response within 3-5s of being asked a question. Correct responses included the main phrases given previously. Additional words at the beginning or end of these phrases were deemed correct if the answer made sense and was not broken up by additional words. For example, if a correct response was, “because it’s his birthday” and if the participant said “because it’s his birthday today” this was deemed correct. If two responses were given the last response was used. For example, if a correct response was “on his face” and the participant said “on his face, no, on his head” this would be deemed incorrect. IC was also given if the participant made any vocal noise with the exception of heavy breathing. NR was given for no response or heavy breathing.

Correct responses (C) for emotional recognition were defined as participants touching the correct picture with any part of their hand within 3-5s of being asked to touch a picture. IC was recorded if the wrong picture was touched,

or the picture was touched with another part of the participant's body. NR was recorded if the participant did not touch a picture.

Inter-observer agreement

Video recordings were used to conduct inter-observer reliability checks. The observer viewed the selected video footage for each participant and recorded, correct (C), incorrect (IC) or no response (NR). The trained observer was supplied with the story and response schedule for each of the target behaviours. The oral comprehension story and response schedule consisted of a definition of a correct response and how to score responses that contained two answers or additional words. The story and response schedule also contained each of the five stories, the questions asked by the researcher, the desired answer, other responses that were deemed correct and a guide on how to score non responses. Examples of both correct and incorrect responses were also provided. The trained observer was supplied with a script for the target behaviour emotional recognition which contained; a definition of a correct response, labelled pictures depicting the emotions for each set, and a paragraph outlining when to score responses as incorrect (IC) or as a non response (NR). Reliability was calculated by dividing the total number of agreements for each response by the number of agreements plus disagreements and multiplying by 100% (Copper et al., 1987).

Observational notes (Treatment Fidelity)

Informal observations noted during each session included; recording verbalisations, attention, eye direction, body language, body movements toward pictures, level of comfort or discomfort and whether or not the participants were reminded to "watch the television". These observations assisted in assessment of treatment fidelity. A questionnaire was constructed (Appendix M) to assess consistency in procedures within and across each participant's sessions and participant behaviour. This was completed by both the researcher and the video assistant, and these were compared.

Results

Inter-observer Reliability

Reliability data were collected for 37.5%-100% of sessions from each phase. Table 4 indicates inter-observer agreement across the different phases ranged from 97.9% to 100%. The gray area in Table 4 indicates that generalisation probes were not conducted for P1 and P5 and therefore inter-observer agreement did not need to be calculated.

Table 4. *Percentage of inter-observer agreement for each participant across phases and generalisation probes.*

Inter-observer agreement %						
Participant	**Baseline** (60% of sessions Calculated)	**Generalisation Probes During Baseline** (33% of sessions calculated)	**Post Video Making (extended Baseline)**	**Post Video Making (generalisation)** (100% of Sessions Calculated)	**Intervention 1**	**Generalisation** (100% of Sessions)
P(1)	100%	100%	100% (50% of sessions)	100%	100% (44% of Sessions)	
P (2)	100%	100%	100% (57% of Session)	100%	100% (37.5% of sessions)	100%
P (3)	97.9%	100%	97.9% (45% of sessions)	100%	98.6% (43% of Sessions)	100%
P (4)	100%	100%	98.9% (46% of sessions)	100%	97.9% (43% of Sessions)	100%
P (5)	100%	100%	100% (50% of Sessions)	100%	100% (42% of Sessions)	
P (6)	100%	100%	100% (50% of Sessions)	100%	100% (55% of sessions)	100%

Intervention Fidelity

The fidelity questionnaire (Appendix M) was completed by both the camera assistant and the researcher and indicated the following; the same steps/processes were carried out most of the time if not all of the time across all of the phases of Study 1 for both target behaviours and all participants. No intentional prompting or reinforcement was used in the phases they should not have been. Videos shown to participants were of similar content relative to the target behaviour. That is; those participants in the oral comprehension condition had similar videos to other participants in the same condition, and those in the emotional recognition condition had similar videos to the other participants in the

emotional recognition condition. No rehearsal took place between the researcher and participants during video viewing for either target behaviour.

The fidelity questionnaire examined whether the participants enjoyed each video, paid attention to the video and whether the participants showed signs of distress during video viewing (Appendix M). The researcher and the camera assistant scored a 4 for P2 for the peer video, 5 for the self video and 4 in relation to the P2's level of attention. Both the researcher and the camera assistant scored a 3 for the enjoyment level of P6 for both videos, and a 3 for the level of attention. P2 was believed to enjoy the self over the peer video vignettes, and P6 did not prefer one video type over the other. Both raters scored P3 and P5 across the first three measures as a 5 for both VM conditions. P3 and P5 were not rated as showing a video preference. P4 and P1 were rated slightly different by the researcher and camera assistant. For P4 the researcher scored 3 and 4 respectively for the peer and self videos, and the assistant 4 and 5. Nevertheless, both agreed P4 preferred the self video over the peer video and scored 4 for the level of attention. P1 was rated across all three measures as a 4 by the assistant and no video preference was indicated. In contrast the researcher scored the peer video as a 3, and indicated a preference for the self video by scoring a 4. The researcher also scored a 4 for P1's level of attention. Neither the researcher nor the assistant indicated any of the participants were distressed by the videos.

Video Modelling and Oral Comprehension

Figure 1 illustrates the percentage of correct responses over baseline, post-video making and intervention. The circles show the percentage of correct responses across the questions used in the VPM condition and the crosses show the correct responses for the questions used in the VSM condition. The filled diamonds illustrate the percentage of correct responses for the generalisation questions. Figure 1 illustrates P1 and P2 responded at 0% across all phases of the research and for generalisation stimuli. Both forms of VM were ineffective in increasing correct responding with these 2 participants.

Informal observational notes made by the researcher and the camera assistant (recording verbalisations, attention, eye direction, body language etc) indicated an increase in clearer more related verbalisations made by P1 during the intervention phase (P1 mumbled answers or made inaudible sounds during the

first two phases). Nevertheless, these verbalisations tended to be echolaic, singular and repetitive words. Initially P1 seemed highly interested in the video vignettes. However, following the initial presentation P1 seemed moderately interested in the self video and somewhat less in the peer video and had to be reminded to watch the television on several occasions. Generalisation data could not be collected as this participant relocated to another city.

Observational notes for P2 indicated some interest in the video vignettes, particularly the self video. P2 asked several times to watch the self video instead of the peer video. Nevertheless, P2 still appeared observant and receptive of the peer video. P2 confidently imitated the researcher reading the stories on the video, and occasionally would repeat answers to some of the questions whilst watching the vignettes. On several occasions P2 had to be reminded to watch the videos and P2 responded to the questions on many occasions with "I don't know". P2 also tended to ask for feedback for his responses during Intervention 1. For example, P2 would say "is it right" or "that right, that right".

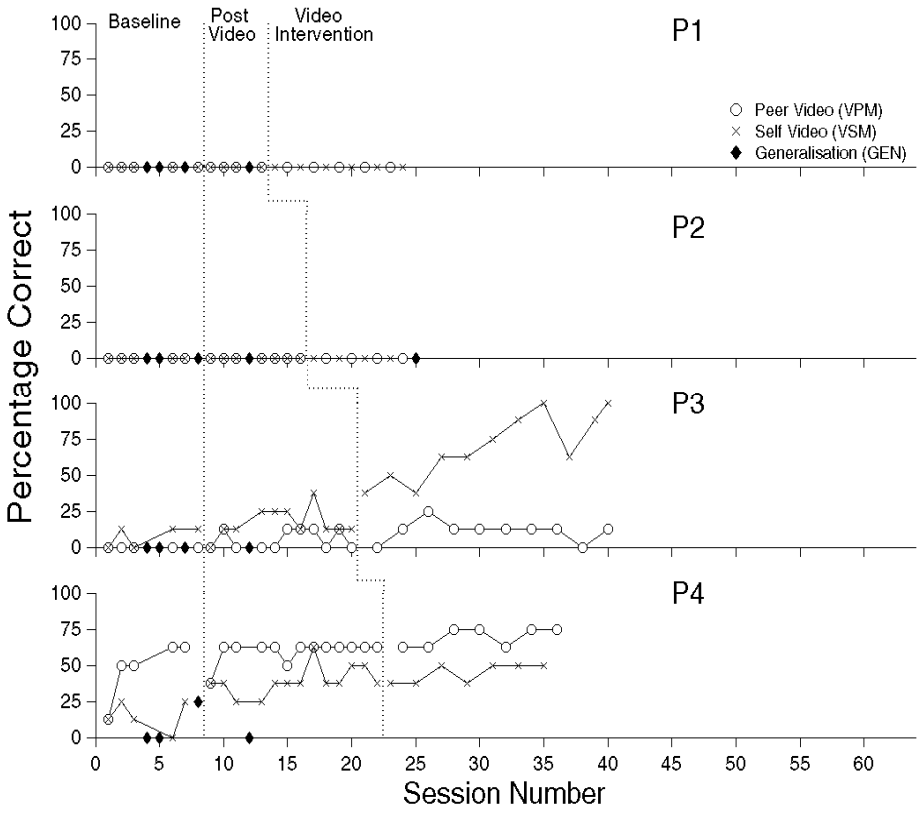


Figure 1. Percentage of correct responses across baseline, post video making and Intervention for P1, P2, P3 and P4 for the target behaviour oral comprehension

Figure 1 indicates that during baseline P3's responding showed an overall increasing trend for the VSM condition and no trend for the VPM condition (see Appendix N for a more detailed analyses of these and subsequent findings). During the post video making phase P3's correct responding showed variability. Overall correct responding increased in comparison to baseline responses, indicating video making had an effect on correct responding for both VM conditions. How much of an effect video making had is unclear due to the amount of overlapping variability between the phases (overlapping variability is examined in Appendix N).

During the intervention phase P3 reached the 80%-100% criterion for the VSM condition, indicating the VSM intervention increased correct responding. However, the increase in correct responding was not instant and it took several sessions to reach the criterion. VPM had little effect on correct responding and the criterion was never reached during this condition. Correct responding for the generalisation probes remained at 0% across all three phases, indicating generalisation did not occur across person, setting or stimuli. P3 scored higher on the WHAT and WHERE questions (used in the self intervention) than the WHEN and WHY questions (used in the peer intervention).

Behavioural observations for P3 suggested that P3 was interested in both modelling videos. P3 also clearly indicated that he wanted to watch a video by saying "let's watch a video today" and that he knew that the video was either of himself or of a peer. Notably, hand flapping and inappropriate vocalisations decreased dramatically during video intervention.

Figure 1 shows, that during baseline P4's correct responding followed an increasing trend for the VPM condition and was variable but had no trend for the VSM condition. The level of correct responding in the post video making phase, remained similar to baseline for the VPM condition, but increased for the VSM condition. This increase in the VSM condition suggests that video making had some effect on responding. During the VPM intervention phase, correct responding increased but did not reach the 80%-100% criterion. However, how much of an effect the intervention had is unclear due to the overlapping variability (the range of values observed across phases) between the post video making and intervention phases (Appendix N). For the VSM condition, video modelling did not have an effect on responding. Figure 1 indicates that P4 like P3, scored higher

on the WHAT and WHERE questions (used in the peer condition) than the WHEN and WHY questions (used in the self condition) and that generalisation across person, setting and stimuli was unsuccessful.

Behavioural observations indicated P4 preferred watching the self video over the peer video (P4 would ask to watch the self video, and sigh when the peer video was played). P4 seemed somewhat restless when watching the peer video and was often reminded to pay attention to the video. Nevertheless, P4 watched both videos and was not discomforted by either video. P4 also requested feedback for his answers and was sometimes confused by the answers given on the videos.

Video Modelling and Emotional recognition

Figure 2 indicates P5 responded at levels of 0% during the baseline phase and the post video making phase for both VM conditions, including generalisation stimuli. Video making did not effect responding for either condition. During the intervention phase P5 never reached the 80%-100% criterion for either VM condition; 0% was scored for all measures for the VSM condition, and responding was always below chance levels (<33%) for the VPM condition. Both VM methods were ineffective at increasing correct responses.

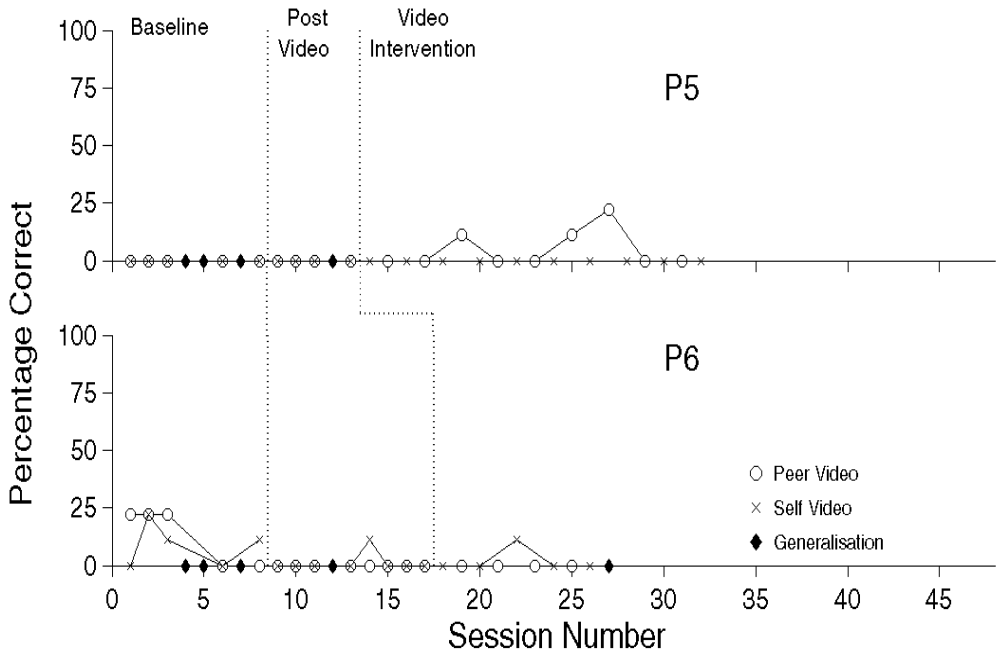


Figure 2. Percentage of correct responses for P5 and P6 across baseline, post video making and intervention for the target behaviour emotional recognition

Behavioural observations indicated P5 was interested (e.g., she faced the television, smiled and laughed while watching the vignette) in both the peer and self video vignettes. P5 had to be reminded to "watch the television" on only a small number of occasions and P5 showed no signs of having an aversion (did not show signs of discomfort) to either video. In fact P5 would get upset if there was a delay to viewing longer than was encountered on an average session. P5 tended to hand flap regularly throughout sessions and also laughed for no apparent reason.

Figure 2 shows that during baseline, P6's correct responding trended downwards for the VPM condition and was variable but did not trend for the VSM condition. During the post-video making phase responding remained close to 0% for both intervention conditions indicating video making had no effect on responding. During the intervention phase the 80%-100% criterion was never reached in either condition, indicating neither method increased correct responding. The target behaviour did not generalize across person, setting or stimuli.

Observational data for P6 illustrated a lack of interest during either video presentation. That is; P6 had to be constantly reminded to watch the television, P6 would focus or play with other things in the room and would continually yawn during video presentation. P6 did not show any signs of aversion (discomfort) to the videos.

Précis of results

Collectively the results for both target behaviour are; post video making had a small effect on responding for 2 out of 6 participants. The level of correct responding for 2 participants increased during the Intervention; P3's correct responding in the VSM condition and P4's correct responding in the VPM condition. However, the VSM condition was the only intervention that increased responding to the 80%-100% criterion. All participants appeared interested in the video vignettes during the first few presentations and then interest waned for 4 out of the 6 participants. Three participants appeared more interested in the self video vignettes; one was interested in both videos and the other 2 showed no preference. Generalisation did not occur for any participant across person, setting or stimuli.

Discussion

The aims of this study were to replicate the past research findings that using VM is an effective intervention strategy for individuals with autism, and to compare the effectiveness of 'self' versus 'peer' VM in the absence of other treatment modalities. The results suggest that VPM or VSM alone were ineffective intervention strategies for addressing emotional recognition and oral comprehension skills with 5 of the 6 children with ASD. Results demonstrated that neither VM procedures promoted acquisition of these behaviours, or promoted generalisation. Subsequently, as 5 of the 6 participants never reached criterion a comparative analysis of the effectiveness of the two interventions could not be made. Interestingly, these results are inconsistent with the majority of past research findings. That is; typically speaking, past VM research has found both VM strategies to be effective with this population across a variety of target behaviours, individuals, and situations (e.g. Apple et al., 2005; Bellini and Akullain, 2007, & Delano, 2007; Sturmey, 2003; Dowrick, 2001; Goldsmith & LeBlanc, 2004; Corbett, 2003; Kranz et al., 1991, Graetz et al., 2006). The question then is why this study found inconsistent results to past research. The following paragraphs seek to explore the possible reasons for this difference.

Perhaps, VM is only effective with certain types of target behaviours and those selected for this thesis (oral comprehension and emotional recognition) were not appropriate behaviours to train using VM. The difference between past research findings and the findings of this study could be due to different and perhaps inappropriate target behaviours being selected in this study. Though this seems unlikely as none of the literature suggests VM interventions should only be used for specific types of target behaviour. Furthermore, the target behaviours under investigation in this thesis were chosen from a list of target behaviours noted in past research, and this past research supported the use of VM with these target behaviours (e.g., Corbett, 2003; Charlop-Christy et al., 2000; Charlop-Christy, Carpenter and Dennis, 2001). For instance, Delano (2007) noted four general areas of investigation which have successfully used VM; social-communicative behaviours, functional living skills, answering perspective-taking questions and challenging behaviours. According to Delano (2007) social-communicative behaviour includes; social initiations, language production, verbal statements and conversational speech. The target behaviour (conversation skills)

trained by Sherer et al. (2001), Delano (2007) assigns to the latter category. This target behaviour (with the exception of a return response) was also used in this study but was referred to as oral comprehension. Consequently, it was assumed that training social-communicative behaviour (oral comprehension) in the present study would also be appropriate.

Delano (2007) does not directly assign emotional recognition to any of these categories, but does note the study undertaken by Charlop-Christy et al. (2000) which examined expressive labelling of emotions. There are several similarities between the study undertaken by Charlop-Christy et al. (2000) and the present study. Based on the similarities and success of the study undertaken by Charlop-Christy et al. (2000), it might be assumed that emotional recognition is an appropriate behaviour to train using VM. What is more, it appears that emotional recognition is very similar to other behaviours targeted in two of the categories Delano (2007) describes. It appears that emotional recognition could fit into the social-communicative category. Corbett (2003) says identification of facial expressions is an important component of socio-emotional development and communication. Socio-development and communication were the common themes in the studies that Delano (2007) assigned to the social-communicative category. Therefore, it might be expected that another study (such as this) that focuses on a target behaviour that teaches socio-emotional and communication skills using VM, would be appropriate.

Alternatively, emotional recognition might fit into Delano's (2007) perspective taking category. Delano (2007) notes children with autism find it difficult to understand another person's perspective (something required in understanding other people's emotions). Delano (2007) says this category includes those studies that present a scenario and then ask questions about the scenario, which call for the child to make a response that indicates they understand another person's perspective. The emotional recognition component of this study appears to fit into this category. As the target behaviour emotional recognition trained in this study is very similar to those that Delano (2007) assigns to the perspective taking category, it might be assumed that it is appropriate to target for instruction.

Conceivably, the difference between past research and this study could be due participants lacking the prerequisite skills needed for VM training (as opposed

to the skills needed to carryout the target behaviour). Although the checklist completed with the teacher and parents indicated that participants had self recognition, could follow simple instructions, and could imitate the behaviour of others; these pre-requisite skills for VM training were not directly tested. Perhaps some of the participants actually did not have imitative repertoires for example. According to Cooper et al. (1987)

> Most infants and children acquire skills by imitation in incidental interactions between behaviour and the environment. Parents and other caregivers do not usually have to apply specific instructional programs to facilitate an imitative repertoire. However, some infants and children, often with severe retardation or behavioural handicaps, fail to develop these skills (p.369).

It is possible that the questionnaires and interviews conducted with the teachers and parents were not a true reflection of the participant's abilities. Some of the participants may have needed imitation training prior to intervention. Furthermore, some of the participants may have needed to be taught to follow simple instructions or to self recognise. Examination of past research indicated none of the studies directly tested if participants had the pre-requisite skills for VM training (or at least this was not specified). Though, one study stated the participants had nonverbal imitative repertoires (Charlop-Christy et al., 2000), one stated the participants had imitation skills (Gena et al., 2005),one said participants had prior experience with VM and showed sustained attention (MacDonald et al., 2005) and one utilised a questionnaire (Buggy, 2005). In hind sight and for future reference, testing whether participants have the skills needed to undertake VM training may rule out speculation around this issue.

Striefel (in Cooper et al., 1987) points out that in order to train imitation of a new skill (the target behaviour) the appropriate level of difficulty must be selected. That is; consideration must be given to task complexity and age suitability of the task. It is possible that the target behaviour used in this thesis was outside of the participant's skill level and that participants lacked some of the pre-requisite skills to carry out the target behaviour (as opposed to pre-requisite skills for VM training). For example; the parents/caregivers and teachers of each participant were not asked if the participants could point to pictures when asked. What is more, probing was not conducted prior to baseline. That is; participants

were not directly tested to see if they could point to specific objects when asked too. If probing had been conducted, it might have been determined that some components of the target behaviour needed to be trained. For instance, the participants in the emotional recognition condition may have needed to be trained to touch pictures before being trained to differentiate emotions and picture touch. Examination of past VM research indicated other studies also did not conduct pre-tests with participants. Many of the studies described the behaviours the participants could and could not do, but did not specifically state whether these were pre-tested. Out of the studies examined, participant behaviour was directly observed in two studies (Taylor et al., 1999 & Shipley-Benamou et al., 2002), assessments performed as part of the child's curriculum or individualised education plan were used in two studies (Wet & Nesworth, 2003 & Charlop-Christy et al., 2000), interviews or questionnaires similar to the one used in this study were used in another two studies (Buggey, 2005 & Apple et al., 2005) and none used probes prior to conducting the study. Based on these findings it appears this study undertook much the same procedures as past research. However, to ensure that participants had the prerequisite skills, it would have been worth undertaking pre-tests, and this would be recommended for future studies.

Additionally, it is possible that because two types of VM interventions were compared, that a VM intervention in one condition may have confounded with the next VM condition (particularly for oral comprehension). Both Cooper et al. (1987) and Poling et al. (1995) highlight confounding as a potential limitation of the alternating treatments method. Although treatments in this study were alternated, presented on separate days, and the questions differed between conditions; the stories remained the same. Confusion may have resulted from hearing the same story each day even though the intervention changed. Had the interventions differed by both story and question type then such confusion may have been less likely. Many of the studies examined for this thesis did not compare interventions and therefore would never have encountered this potential problem. Nevertheless, both Charlop-Christy et al. (2000) and Sherer et al. (2001) conducted comparative studies and confounding did not seem to be an issue they encountered (at least this point was never raised). Both studies yielded significant results, and results corresponded with other research that did not compare treatments.

The results show that VSM was a more effective intervention then VPM for P3, and that VPM improved P4's responding more so than VSM (indicative of individual differences). However, when examining responding across the phases it appears that these 2 participants may have found the WHAT and WHERE question types (used in the VSM phase for P3 and VPM phase for P4) easier then the WHERE and WHEN. Thus, even though VSM did increase responding to criterion for P3 and VPM increased responding for P4, a contributing factor may have been due to a disparity in question difficulty. It is possible (though speculative) that if question difficulty were identical, then an increase in responding may have been noted in the other VM conditions (VPM for P3 and VSM for P4). If this were the case, then it would be easy to compare VM types and conclude that there was or was not a difference between the two methods. Nevertheless, it is important not to overlook the fact that P4 did not reach criterion and P1 and P2 did not find one question type easier than the other, as they scored 0% correct. Therefore, these results should be interpreted with caution; it can not be categorically stated that question difficulty did or did not differ, or that one VM method was undeniably more effective than the other during these phases.

Additionally, it was suspected that the clarity of the participant's speech on the peer video may have contributed to the failure of this method for P3. The researcher and camera assistant both agreed that at various times on the video vignette, the participant's speech was barely audible. That is; P1's speech was barely audible on the peer video used for P3. Although the best take was utilised as the footage for intervention, the fact that this participant's speech was typically unclear, may have contributed to its ineffectiveness. To determine whether this was a contributing factor, and whether VPM was actually ineffective with P3, utilization of another peer video would be recommended to resolve this uncertainty.

The results can also be examined in relation to the four mediating processes (attention, retention, production and motivation) thought to facilitate observational learning. It is believed that television provides a restricted area of focus and therefore increases *attention*. However, it may be the case that some of the participants in this study paid less attention to the videos than other participants. Furthermore, a restricted area of focus does not necessarily mean that this will be the participant's primary focus. Observational notes indicate that for at

least one of the conditions P1, P2, P4 and P6, had to be reminded to watch the television. The fidelity questionnaires (Appendix M) also indicate these participants (P1, P2, P4, & P6) watched the video most of the time as opposed to all of the time; with the participants scoring a 4. Cooper et al. (1987) point out that without paying attention to the model imitation is impossible. Cooper et al. (1987) says "attending is a pre-requisite for imitation training" (p.370)

In relation to the process of *retention*; although the videos were repeated, and the opportunities for retention were increased, it could also be argued that the repetition of the vignettes could actually result in satiation or habituation. Interestingly, a study conducted by Karsten (in James, 1962) indicated that when various tasks were repeatedly performed, a decrease in the quality of the task, an increase in the number of errors, disintegration and loss of task meaning, increases in the attractiveness of other tasks, emotional outbursts and expressions of dislike could be noted. Karsten (cited in James, 1962) attributed these responses to semantic satiation. The type of satiation noted in this thesis is typically referred to as stimulus satiation rather then semantic satiation, but essentially is another name for the same process (James, 1962). Although, the tasks that Karsten (cited in James, 1962) had her participants perform differed from the tasks used in this thesis, the resultant behaviours noted from continuous repetition were not. For instance, P6 decreased responding during the VPM condition, would yawn continually during video viewing, would focus on other items in the room, and would sigh during video presentation. P2 and P4 would make comments such as "oh can I watch my video" when viewing the peer video, or sigh when the video was re-presented. In relation to the findings for P3, this theory still seems viable. The variation noted between participants could be explained by individual differences. According to James (1962) personality characteristics may be considered important determinants of semantic satiation for participants, though this theory is still in need of further validation.

Habituation, defined as a decrease in responsiveness (Merriam-Webster Online, 2005; Wikipedia, 2007 & Britannica, 2007), occurs when responses are not rewarded or punished. Observational notes indicated that participants all seemed highly interested in the first few video presentations, thereafter some of the participants' interest dwindled. Perhaps, incorporating reinforcement or feedback into the intervention may have a different effect on responding for

participants. A number of VM studies examined for this thesis included feedback, reinforcement, or prompting in their experimental conditions. For example, Gena et al. (2005), Maione and Mirenda (2006), Murzynski and Bourret (2007), Shipley-Benamou et al. (2002), Taylor, Levin and Jasper (1999). Additionally, Bellini, Akullain (2007) and Delano's (2007) meta-analyses further highlight that VM and VSM are often combined with other therapeutic methods, and very few examine VM as a single treatment modality. One study that examined VM alone and then VM in combination with other treatment modalities was Apple et al's. (2005) study. Apple et al. (2005) found that VM alone did not produce compliment-giving responses for the participants in their study. Consequently, reinforcement and self-management procedures were added to the VM procedure before positive gains were noted.

In relation to the process of *motivation*; it is argued that children with autism show a fondness for television, associate television/video with leisure activities and therefore are more receptive. It is also thought children with autism may find television naturally reinforcing and inherently motivating (Charlop-Christy et al., 2005). It may be argued that this is not the case for the participants of this study. By definition, if the television/video was inherently reinforcing or motivating one might expect to see an increase in behaviours associated with; viewing the video, access to the video and behaviours viewed on the video (the target behaviour). This not being the case (which it was not for several participants) these particular videos would probably not be classed as reinforcing. This does not mean to say other videos or television programmes aren't reinforcing, but rather that television in 'general', or these specifically designed videos, may not be 'inherently' reinforcing for this population. Perhaps there are certain aspects of what is being viewed that makes particular programmes or videos reinforcing. For example; animation, colour, music, the participant viewed being praised, voice-overs, or word placement to point something out to the viewers (none of which were included in these video vignettes). Based on this analysis, one might predict that because the first three mediating processes failed, the fourth process *production* would also fail. That is; production of the observed behaviour would not take place, as was the case for several participants of this study.

Intervention 2

Clearly, employing and comparing the VM interventions in this study resulted in more uncertainty, inconclusive results and more questions than answers. An additional intervention phase was added for several reasons. First, because sole VM either did not produce the desired target behaviour, or did not improve the target behaviour enough that criterion could be reached. Second, it was deemed more ethical to try and find an alternative method to produce the target behaviours, than to leave either little or no significant changes. Third, it would help decide whether VM in conjunction with reinforcement and prompting is more successful then VM alone, and whether the target behaviours were appropriate for the participants of this study. Lastly, this intervention phase was added as it was believed that the clarity of P1's speech was poor on the video vignette shown to P3, and that another video depicting a peer with more audible speech, may produce more encouraging results.

Method

Video modelling with supplementary assistance

During this intervention the steps carried out in the prior intervention were also carried out. The only distinction was the additional assistance added during questioning or instruction for P2, P4, P5 and P6. Participants were still required to watch the video vignettes, and these were still shown on alternate week days. The supplementary assistance during this phase was selected based on the participant's level of responding (high vs. low) in the first intervention and their ability level (i.e., verbal and imitation ability and instruction compliance). For example, P5 whose was non-verbal and showed low amounts of correct responding in Intervention 1, received most to least physical prompting during Intervention 2 as opposed to other less intrusive types of prompting that might be used with a participant who was responding correctly at a higher level. The type of reinforcement used for each participant was determined by the participant's teacher, parents and/or the researcher.P1 moved and therefore was not included in this intervention.

Supplementary assistance for P2 and P4 involved verbal prompting (using the answers from the story and response schedule) and reinforcement (stickers and computer time). This additional assistance was supplied via discrete trial training. Prior to intervention a form was completed outlining, the discrete trial training

curriculum involved in this training, the reinforcement the participant would receive and when, and the criteria for moving up or down levels or steps. Appendix O illustrates the procedures undertaken for P2 and P4, and Appendix P the data sheet completed for both participants during this phase.

No reinforcement or prompting was utilised with P3; rather the peer video of P1 was exchanged with the video vignette of P4. As the criterion was already reached in the VSM phase, VM treatments were no longer alternated, and P3 was only shown the VPM vignette.

Assistance for P5 and P6 involved physical prompting and reinforcement. The discrete trial training procedures adhered to for these participants are provided in Appendix Q and the data sheets completed in Appendix R. Reinforcement given to P5 included; a my little pony, a kaleidoscope, a Barbie doll, bubbles, a magazine, an instrument that made gurgling sounds, a Barbie mirror and brush, a sparkly windmill, and a keyboard. P5 was allowed to pick one of these stimuli and play with it for 15-30s, verbal praise was also given. A music ball, a song played on the computer (for 30-50s), bubbles or a handclapping game were used as reinforcement for P6.

Scoring

All sessions were recorded on videotape (except when the participant viewed the intervention video). Correct responses were defined using the same response schedule and criteria that were used in Intervention 1 (Table 1 gives an example), but the data collection sheets used differed for all participants (Appendix P and Q) except P3. The procedures for scoring are given in Appendix O and P. For discrete trial training, scoring for levels 1-3 was as follows;
Level 1 and 2: C was recorded if the correct response was within 3-5s (touch the correct picture or give the correct verbal response) an IC was recorded if the wrong picture was touched, the picture was touched with another part of the participant's body (for emotional recognition), or the wrong answer was given within 3-5seconds (oral comprehension). NR was recorded if the participant did not touch a picture (emotional recognition) or did not give a verbal response (oral comprehension).Level 3: CP was scored if the participant touched the correct picture (emotional recognition), or gave the correct verbal response (oral comprehension) following prompting. An ICP was scored if the participant

touched the incorrect picture or the participant gave an incorrect verbal response that differed from the verbal or physical prompt.

Follow-up:

Follow-up data were collected 6 weeks after the conclusion of Intervention 2 to assess maintenance of gains. Follow-up data was collected for the participants who achieved the required criterion or showed improvements (P2, P3, & P4). The data collected during the follow-up phase were identical to those collected during baseline, and were collected for two consecutive days.

Results and Discussion

Inter-observer agreement

Reliability data were collected for 40%-100% of sessions from each phase and for generalisation probes. Table 5 indicates high inter-observer agreement across the different phases; reliability ranged from 96%-100%.

Table 5. *Percentage of inter-observer agreement for each participant across Intervention 2, generalisation probes and follow-up*

Inter-observer agreement %			
Participant	**Intervention 2**	**Generalisation** (100% of Sessions)	**Follow-up**
P (1)			
P (2)	96% (40% of sessions)	100%	100%
P (3)	100% (41%)	100%	100%
P (4)	100% (40% of sessions)	100%	100%
P (5)	100% (44% of sessions)		
P (6)	100% (45% of sessions)	100%	

Intervention Fidelity

Intervention fidelity during Intervention 2 was similar to fidelity during Intervention 1. The only difference was that P1 no longer participated in the study and the camera assistants rating for P4 dropped to match the researchers. Both the researcher and the assistant agreed reinforcement was always given in a consistent manner. When asked to rank participants in order of who preferred the videos the most the camera assistant and researcher agreed on the following; P3, P5, P2, P4, P1, P6.

Oral Comprehension Intervention 2

During Intervention 2 correct responses increased for P2 for both of the VM conditions (see Appendix N for a detailed trend analyses for this and subsequent results). Figure 3 illustrates the considerable change in responding from the first intervention to the second for both VM conditions. Interestingly, such responses are unlikely to be the result of chance since the participant had to give specific answers from a pre-determined response schedule (making it difficult to guess answers), and on several occasions correct responses for P2 reached 50% (which is greater then chance levels). Nonetheless, after a total of 62

viewings and 93 times hearing the stories per condition, the criterion was not reached in either VM condition. Yet, despite VSM and VPM's ineffectiveness in increasing correct responses to criterion, what the results to do show is that this participant's behaviour was altered more by the combination of interventions then the VM alone. This observation does not seem unexpected since P2 would ask for feedback during Intervention 1. Additionally, generalisation did not occur across the three dimensions and improvements noted during intervention maintained at follow-up for both VM condition. That is; correct responses remained within the range noted during intervention similarly for the VM conditions.

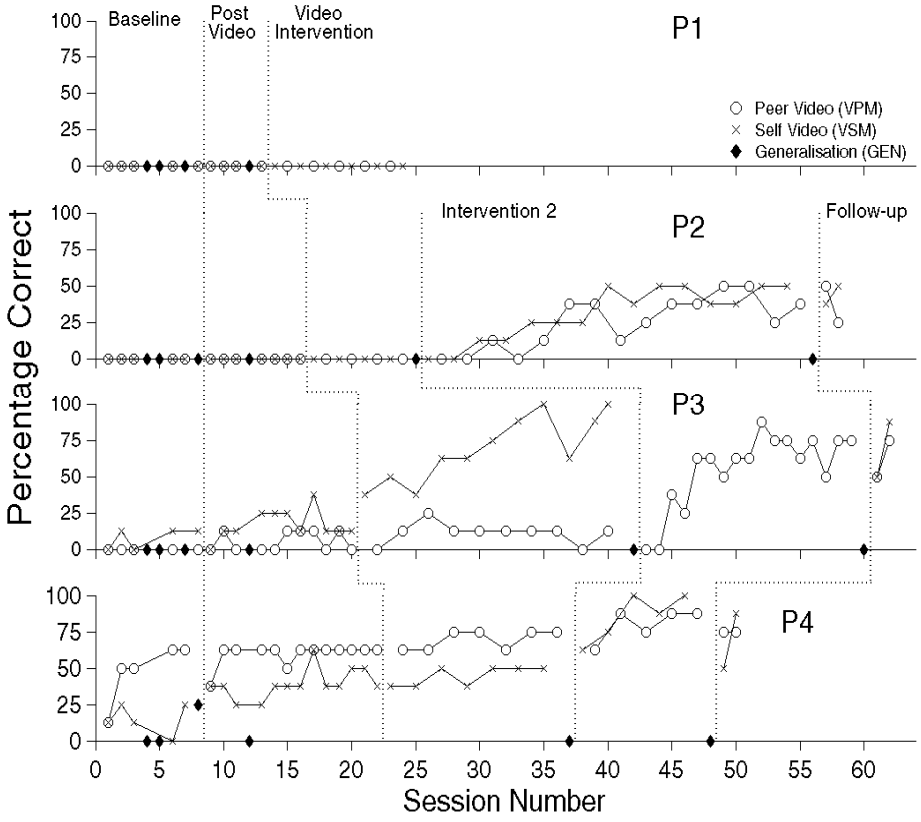


Figure 3. Percentage of correct responses for P1, P2, P3 and P4 across all phases for the target behaviour oral comprehension

Observational notes indicated that P2 could confidently imitate the researcher reading the stories on the video, and would repeat answers to most of the questions whilst watching the video vignettes. Though, it is not clear exactly why P2 could readily repeat all the answers during video viewing but not during questioning. It was hypothesised that perhaps P2 only knew the answers in the

order given on the video, and had learnt to echo the answers in that sequence. Yet, when examining the sessions that followed the same sequence as that on the videos no apparent difference could be noted between these sessions and those that had a different sequence. Conceivably, P2 may have answered more poorly during questioning then during video viewing, because P2 was under pressure during this time to answer correctly in order to receive reinforcement. P2 also requested to watch the self video prior to video viewing and would sigh or protest if the video was not of him; though he would still watch the peer video. P2 decreased the number of times he said "I don't know" during this phase.

During Intervention 2 P3 did not receive prompting or reinforcement but instead was shown a new peer video. Despite the fact that this peer video was not matched by setting or by peer characteristics (age, familiarity or ability), P3 still increased responding over and above previous responding levels (Figure 3). In fact P3's mean correct improved from 11.25% during Intervention 1 to 55.15% during Intervention 2 (Appendix N). Such a result suggests that in fact the original participant's speech did play a significant role in the VPM's ineffectiveness.

Nonetheless, even though P3 scored 87.5% during one session, P3 did not reach the criterion on two consecutive occasions, as per the criteria. On completion of data collection, P3 had viewed the new peer video on 17 occasions (a total of 34 times) and still had not reached the criteria; whilst he viewed the self video only 11 times (a total of 22 times) during Intervention 1 before reaching the criteria. What is more, the grand total of viewings across all phases for the peer video was 86 and the number of times the participant heard the stories was 129. Even if the video viewings from Intervention 1 were discounted (due to the peer's speech) the total number of times P3 would have heard the story would have been 109 in comparison to 81(across all phases) for the self video. Such a result confirms the notion that VSM was more effective then VPM for P3. Though, VPM did improve correct responding.

Generalisation data were collected following this phase and there was no generalisation. Follow-up data indicated VM effects maintained over time for both conditions. Initially, (during follow-up) correct responding was 50% for both VM conditions (the participant was noted to be inattentive and tired) but increased to the 87.5%-100% criterion for the VSM condition and 75% for the VPM condition. This level of correct responding was also noted for both conditions during

intervention. Observational notes for P3 paralleled those collected during Intervention 1. P3 always appeared to enjoy the video vignette and his self stimulatory behaviours were dramatically reduced.

During Intervention 2, P4 reached criterion for both VM interventions. The 80%-100% criterion was reached after four sessions for the VSM condition and five for the VPM condition (Figure 3). The latency to change (the time between a change in conditions and a change in behaviour) was after one session for the self video and two for the peer video (Appendix N). These measures indicate that both forms of video modelling with supplementary assistance were effective treatment modalities for teaching P4 oral comprehension. When comparing the data from the two VM methods, slight and possibly inconsequential differences can be noted in relation to the latency to change, when the criterion was reached and the highest scored obtained. These are, respectively, 1vs.2, 4vs.5, and 100% vs. 87.5%. Notably, these differences are opposite to the responding levels noted in the prior phases. Consequently, these results do not support the earlier hypothesis proposed in relation to question disparity. Generalisation was tested following Intervention 2, and Figure 3 indicates that generalisation did not occur across person, setting or stimulus.

Follow-up data indicated that for the initial session the level of correct responses dropped for both conditions under the 80%-100% criterion level, but increased for the second session to the criterion level for the self condition (see Figure 2).These results indicate that the gains achieved during Intervention 2 were only maintained for the VSM condition, and suggest that the VPM intervention with supplementary assistance did not have a sustained effect on correct responding as responding dropped to the level of the first intervention phase. Interestingly, the difference thought to be of no consequence between the VSM and VPM conditions may in fact be of consequence when it comes to maintenance of gains. Perhaps it is important to improve the target behaviour to the 100% criterion than 80% or above. Observational data for P4 indicated that this participant appeared to prefer the self video vignette over the peer video vignette. However, P4 seemed only moderately interested in the vignettes and had to be reminded to watch both the videos. P4 did not seem discomforted by either video.

Emotional Recognition Intervention 2

P5 responded at levels of 0% across all measures for both VM conditions in the new intervention phase; indicating prompting and reinforcement had no effect on responding (Figure 4). Generalisation data was not collected for P5 as the teacher aid was unavailable. Figure 4 shows the percentage correct for P5 and P6 across all the phases of both studies. On analysis on the number of picture touches emitted by P5 during this phase, it is apparent there was little or no increase in picture touching (Figure 5). The bar graph shown in Figure 5 illustrates the number of correct and incorrect picture touches across each phase divided by the number of opportunities to picture touch multiplied by 100%. Since P5 did not increase picture touching, an additional observation period took place in the participant's classroom after data collection was completed. This observation period took place as it was expected that P5 would have increased picture touching regardless of whether the pictures touched were correct. This is; if P5 had picture touching in her repertoire and the items used as reinforcement were reinforcing, correct responding would have been at least at chance levels (33%). This observational period indicated P5 did not mand for items in her environment by pointing, nor did P5 point or touch items when instructed to do so. This observation suggests P5 may not have acquired pointing in her behavioural repertoire. Without this pre-requisite skill, the task emotional recognition was probably too complex for P5's ability level and supports one of the hypotheses proposed prior to Intervention 2. As would be expected (as the skill was not acquired) generalisation did not occur for this participant across the three measures.

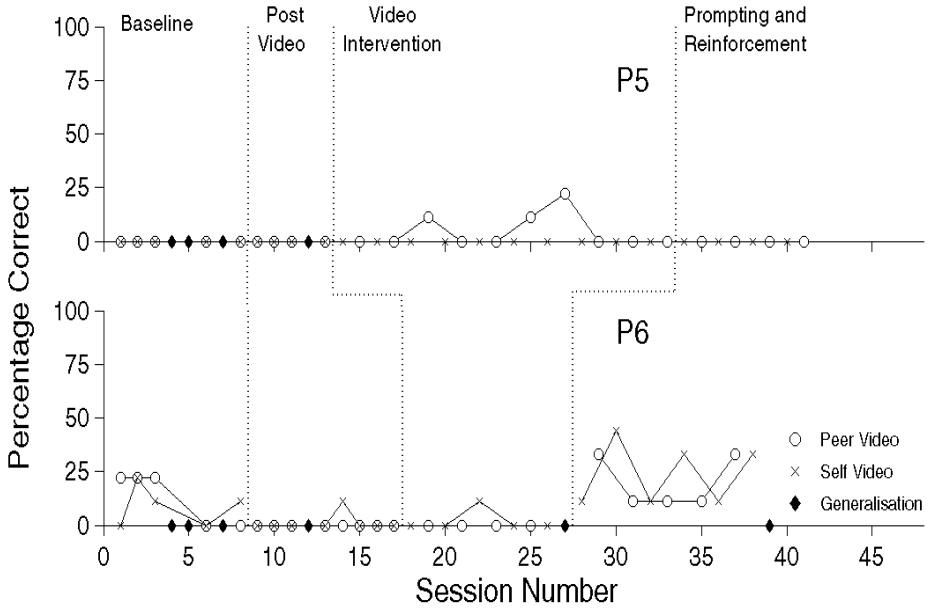


Figure 4. Percentage of correct responses for P5 and P6 for the target behaviour emotional recognition across Intervention 2 phases.

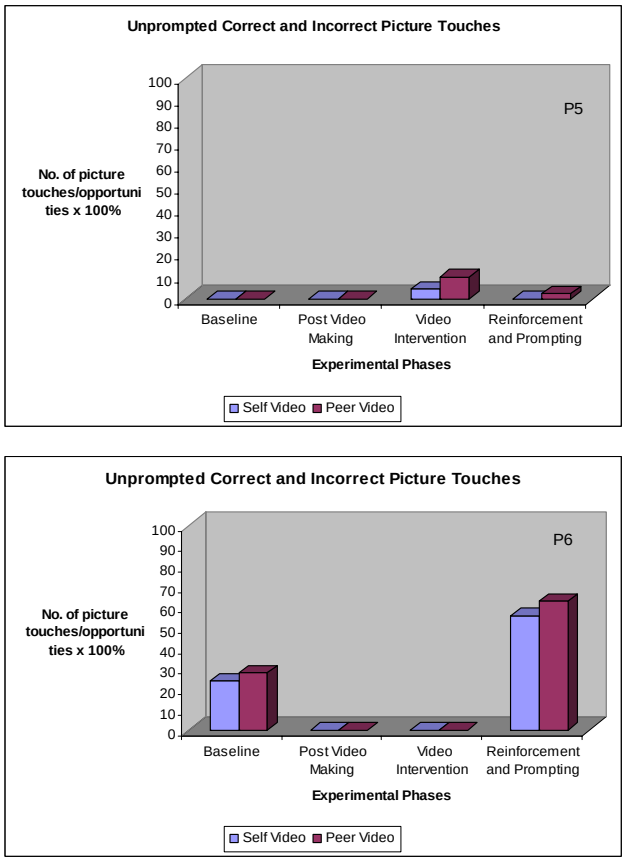


Figure 5. Number of correct and incorrect picture touches across each phase and intervention for P5 and P6.

Results of the behavioural observations for P5 during Intervention 2 paralleled those obtained during Intervention 1. However, there was some new behaviour. For instance, P5 would put her arm up across her face as though obstructing her view of the television, but she would proceed to look over or under her arm. P5 would also try and position her body on an angle away from the television but turned her head to face the television. P5 continued to smile during video presentations, but hand flapping and inappropriate laughing were dramatically reduced. P5 also appeared to become prompt dependant very quickly during this intervention and would put her arm out to be prompted following questioning.

During the prompting and reinforcement phase, P6 showed a small increase in responding for both VM conditions in comparison to previous conditions; though the criterion was never reached for either condition. Furthermore, the level of responding overlapped somewhat with previous levels of responding in the other conditions, and the level of responding during this intervention phase was at chance levels (less then 33%) for all sessions in both VM conditions, except for one session in the VSM condition. These results indicate that both forms of VM with supplementary assistance were ineffective in teaching the target behaviour emotional recognition to P6. Generalisation did not occur for P6 across the three measures, adding additional support to the ineffectiveness of VM with this participant.

On analysis of the number of picture touches emitted by P6 during both VM conditions, it is apparent the picture touching increased dramatically during this phase (Figure 5). Picture touching increased from 24% in baseline for the VSM condition and 28% for the VPM condition (zero was scored for the other two phases in both conditions) to 79% and 84% respectively in the prompting and reinforcement phase. This increase in picture touching reinforces the idea that P6 did in fact have picture touching in her behavioural repertoire. Furthermore, this result strengthens the idea that the tangible items and verbal praise used in this phase were reinforcing, though ineffective in increasing the target behaviour.

Behavioural observations indicated that P6 continued to show little interest in either video vignette during this intervention. P6 had to be constantly reminded to watch the television and was easily distracted. P6 would, yawn, touch the

computer keypad, light fittings, or attempt to mute the video. However, P6 never showed any signs of severe discomfort, only boredom.

Précis of findings; Intervention 2

Due to the failure of VM as a sole intervention method with 5 participants, a secondary intervention modality was included in this study. The results of the supplementary assistance (verbal prompting and reinforcement) for the oral comprehension condition indicated; a) supplementary assistance was successful in improving the level of correct responding for 2 participants in both VM conditions (though only one to criterion), and b) indicated that generalisation was unsuccessful across person, setting or stimuli. Furthermore, follow-up data indicated correct responding for 2 participants remained at levels noted during intervention. For 1 participant, VSM effects remained at criterion during follow-up, but VPM effects dropped to levels noted during Intervention 1. Additionally, the new peer video vignette increased P3's responding above the level found during Intervention 1 and suggests the original peer video prevented improvement of the target behaviour. In relation to emotional recognition the following was established; supplementary assistance was unsuccessful for both participants and as would be expected, did not generalize across person, setting or stimuli. Additionally, the results indicate that 1 participant probably did not have the pre-requisite skills to carry out the target behaviour, whilst the other did have the pre-requisites given picture touching improved so dramatically.

General Discussion

The effectiveness of VM has been frequently documented across a wide variety of populations, including special populations (Graetz, et al., 2006; Krantz et al., 1991). Encompassed in these special populations are autistic individuals and in recent time, interest in the use of VM with this population has emerged (Charlop-Christy, Le & Freeman, 2000; Sherer et al., 2001). Children with autism typically display social and communicative deficits and restrictive, repetitive, stereotyped behaviours (Carr, 2006; Corbett & Abdullah, 2005; Dempsey & Foreman, 2001; Harris, 2004). Often these deficits can obstruct treatment and can make this population difficult to treat. However, it is argued that VM procedures are appropriate for individuals with autism and that VM in its different modalities is a successful procedure (Corbett & Abdullah, 2005).

This study, however, was unable to replicate past findings that using VM with this population is an effective intervention strategy; only 1 participant reached the criteria for one VM condition. That is; out of the 12 possible times VM (self or peer) could have been effective, it was only effective on one occasion. What is more, for this one occasion the criterion was not met immediately, rather it took several sessions to reach; suggesting that VM was not as potent as past research implies. Due to the fact that only 1 participant reached the criterion, it was not feasible to compare the VM treatments with each other across participants. However, this result does signify individual differences, and suggests that VSM was more effective (albeit at a slow pace) then VPM for 1 participant.

Interestingly, several weeks before the completion of this thesis another study comparing VPM and VSM was published (Santini, 2007). Participants in this study were severely disabled low functioning individuals. This study found no difference between the VM methods. That is, some participants improved correct responses more from the VPM method whilst other improved more from the VSM condition. Additionally, this recent study found that, although all participants increased responding following VM, none showed the dramatic improvements found in other research. In fact, none of the participants scored above 56% or improved responding by more then 30%. Santini (2007) argues that such a result indicates that VSM is effective for some participants and VPM is effective for other participants. However, only small improvements were noted and in fact,

Santini's (2007) results are quite similar to the results found in the first and second part of this present study, in that less dramatic, slow improvements were noted for some of the participants.

The addition of supplementary assistance (prompting and reinforcement) to the VM treatments in this present study, did not give as encouraging results as past research suggested. Even with the supplementary assistance VM did not facilitate (to criterion) the acquisition of the target behaviours for 3 of the 4 remaining participants. What is more, for the one participant who did reach the criteria, the gains were only maintained for the VSM condition at follow-up. Interestingly, for an additional participant, correct responding noted in Intervention 2 maintained at follow-up, though correct responding never exceeded 50%. In addition generalisation did not occur across, person, stimuli or setting for any of the participants after either intervention.

The question then is why this present study produced results contradictory to past research, given that the methodology behind this study was derived from past research, and that the measures of intervention fidelity indicated procedural reliability for this study. It is plausible that variation in other studies experimental control could contribute to the difference. Bellini et al. (2007) note that the teachers in their study may have been more attentive to the target behaviour following the introduction of the VM intervention. Subsequently, Bellini et al. (2007) suggests that one limitation to their study is that teachers may have unintentionally increased reinforcement and prompting outside of the observational periods. It is possible that this may be the case in other VM studies too. Just knowing the experimental goal and target behaviour may result in more attention been given to the target behaviour outside of experimental settings. Hence, any improvements may be attributed to both the intervention, and to the increased attention and reinforcement provided in other settings.

Additional examples include Wert and Neisworth's (2003) and Buggey's (2005) study. In Wert and Neisworth's (2003) study parents and behaviour therapists (already employed with the families) were not blind to the objective. In fact, parents were responsible for showing the video vignettes to the participants at home, and behaviour therapists were given the role of being the adult prompter in the construction of the video vignette. Although, data were collected at school (video viewing was at home) and adults at the school were advised not to provide

any prompting during data collection, just being aware of the studies intentions may have resulted in requesting being accidentally prompted and reinforced at home by parents, during therapy by therapists, and during school by teachers. In Buggey's (2005) study, it is specifically stated that teacher and other student's knowledge of the study may have been a direct threat to the validity of their study.

Whether or not experimental control or unintentional reinforcement is a problem in other VM studies is not clear. It would seem reasonable to presume that studies that teach social initiations (using toys), or reciprocal play behaviours, would prevent participants accessing the stimulus materials outside of experimental sessions. This would block any opportunity for accidental reinforcement to occur when engaging with the target stimuli. However, some studies do not directly specify whether this is the case or not (e.g., Nikopoulos & Keenan, 2004a; 2004b). Also, it would be foolish to assume that experimental control in all VM studies is threatened, especially as some studies utilize scripts in relation to their dependant measures (e.g., MacDonald et al., 2005; Sherer et al., 2001). Reinforcement and prompting is unlikely when scripts are unavailable to people other then the researcher(s), are only made available during experimental settings, or else correct responses require more then just one behaviour or response. For example, Sherer et al. (2001) required an initial questioning by the researcher, a response, and then a return question by the participant before a response was deemed correct. Undesirable prompting and reinforcement in this type of study would be less likely then in a study which focused solely on spontaneous greetings.

In relation to this present research, it would seem that undesirable prompting and reinforcement was unlikely to have occurred. This is because at no time were the pictures used in the emotional recognition condition available to anyone during any of the studies conditions, or outside of studies sessions. Furthermore, the story and response schedule for the oral comprehension condition were never available to anyone during or after the studies sessions. In fact, the oral comprehension stories and the cards expressing the emotions were never discussed or shown to the teachers or parents of participants at anytime during the study. The only people who heard the three sentence stories or saw the pictures, were the researcher, camera assistant and the teacher aid used during generalisation. Subsequently, if unintentional reinforcement and promoting is a

contributing factor to the success of some VM research, it was not a factor here, and therefore could potentially explain the discrepancies noted between this study and some other studies. Though, further investigation in relation to this theory is warranted.

There are also several other potential reasons why the results of this study may differ from past research. For instance, nearly all the VM studies reviewed used participants who had verbal abilities (e.g., Apple et al., 2005; Bellini et al., 2007; Buggey, 2005; Charlop-Christy et al. 2000; D'Ateno et al. 2003; Gena et al., 2005; Hine & Wolery, 2006; Maione & Mirenda, 2006; MacDonald et al., 2005; Nikopoulas & Keenan, 2004a; Nikopoulas & Keenan, 2004b; Sherer et al., 2001; Shipley-Benamou et al., 2002; Taylor et al., 1999) and in those studies that specified this, many of the participants would likely be considered to be in the moderate to high functioning end of the autism spectrum (e.g., Apple et al., 2005; Buggey 2005; Nikopoulos & Keenan, 2004a; Nikopoulas & Keenan, 2004b). In contrast, 4 participants of this study scored in the severely autistic range and 2 had no verbal language abilities at all. Conceivably the differences may then be put down to differentiation in severity of diagnosis (level of functioning) and verbal language ability between the participants of this study and participants in other research studies. Yet, it might be expected (based on this) that the participant who did reach the criteria would be 1 of the 2 participants who had verbal language abilities and had been given a moderate diagnosis of autism. Although P4 met both criteria, P3 only had the former and scored in the severely autistic range on the CARS scale for the latter. What is more, P3 met the criteria without any supplementary assistance (reinforcement and prompting) where as P4 did not. Accordingly, a more fitting explanation may need to be sort after.

It may well be that participant gender plays a particular role in the effectiveness of VM. Reviews conducted by Delano (2007) and Hitchcock et al. (2003) indicated that the majority of participants in prior VM studies (including those utilising reinforcement) were male rather then female. Whilst this may be accounted for by sex differences in the prevalence rates of autism noted in clinical studies (Carr, 2006; Carter, Black, Tewani, Connolly, Kandlec & Tager-Flusberg, 2007), the lack of VM studies undertaken with females creates problems when comparisons are made between VM studies undertaken predominantly with males to those undertaken with females. According to Carter et al. (2007) studies have

noted sex differences in the clinical manifestation of autism. For example, females have been shown to attain lower IQ scores than males (Lord, Schopler, Revicki, 1982), have intellectual disabilities (Volkmar, Szatmari & Sparrow, 1993), score lower across all measure of cognitive functioning, and be less likely to be deemed high functioning (Honda, Shimizu, Imai, Nitto, 2005). As previously mentioned, participants in most studies tend to be high functioning and verbal, in addition to being male. Given that females are underrepresented in these studies, and that they are more likely to function lower then their male counterparts, it is probable that the males in previous studies aren't analogous to the females in this study. Two out of the 6 participants of this study were females and they both scored higher on the CARS scale then any of their male counterparts, and both also scored at chance levels or lower during intervention phases of this study. All the same, no VM studies have stated that VM should not be used with lower functioning individuals, or that VM is less effective with this population or gender. However, the idea that sex differences exist in the clinical manifestations of autism or what these sex differences are, has not yet been confirmed. In fact, Carter et al. (2007) found females did not perform poorer than males in all aspects of developmental functioning, and this suggests a need for further research in this area.

Several other contributing factors may play a part in the ineffectiveness of the interventions for 1 of the female participants (P5) here. First, it was suspected that the task may have been to complex for her age level or ability. Correct responses were close to zero and picture touching remained at chance levels across all phases during Intervention 1. This idea was further strengthened when the participant's responses remained at zero and picture touching did not increase during Intervention 2. Second, it was suspected that this participant may have never developed generalised imitation skills. According to Martin and Pear (2003), after an individual learns to imitate several behaviours (which may encompass reinforcement, shaping and guidance) they will then be able to imitate a new response on the first trial without reinforcement. It is possible that this participant had never learnt to imitate behaviours at all, or had learned to imitate only a select few and had never acquired generalised imitation skills.

Observational notes indicated that this participant became prompt dependant very quickly during Intervention 2. This observation suggests several

things. First, it might be that too many steps or prompts were provided whilst training the behaviour. Martin and Pear (2003) say that individuals can become prompt dependant if "too many steps are introduced or too many prompts are provided over a number of trials" (p.118).Though, this is unlikely as the steps and/or prompts were reviewed on several occasions following prompt dependency. Second, it might be that imitation training has never been used before with the participant or that imitation training had not been applied correctly in the past. For example, tasks are completed for her or she has been prompted and never experienced reinforcement for completing the task in the absence of assistance.

One argument for the difference between the present results and the published literature is in relation to the types of research studies that are published compared to those that are not. Often termed the file draw problem, it has been suggested that studies published in the behavioural sciences, or used in meta-analytic reviews, are a biased sample of studies (Rosenthal, 1979; Rosenthal, 2005). It is believed that the majority of the studies that are published show significant results, but are a small proportion of the studies which have actually be carried out, and that a larger proportion of studies that are not published (or filed away) may show non-significant results (Coyne, Stefanek & Palmer, 2007). In relation to the research examined for this present study, this idea seems reasonable. Fourteen out of the 19 studies reviewed in Delano's (2007) meta-analysis reported positive gains, five showed mixed results, and none showed non-significant findings across participants. Bellini and Akullain (2007) also conducted a meta-analysis with 23 VSM and VM studies with similar results. Bellini and Akullain (2007) calculated PND scores (percentage of non overlapping data points) for each of the 23 studies and found 10 studies which found VM very effective and 9 which were effective, 3 which were deemed questionable and 1 which was found to be ineffective. Though it is possible that VM may be an exceptionally effective intervention with individuals with autism, it seems doubtful that few or no studies have been undertaken using the VM modelling method that found VM to be ineffective. Surely, at least a few studies would show such results whether due to methodological flaws in design or execution, or to an ineffective teaching method. Another interesting finding from these meta-analytic reviews is that, although it is claimed that many VSM studies

have been undertaken, and that these studies demonstrate VSM's effectiveness with the autistic population, in actual fact, Delano (2007) found very few VSM studies and Bellini and Akullian (2007) found 15 studies examining VM, 7 VSM and 1 examining both.

Two other factors which need consideration are the onset of satiation, and the lack of sufficient exemplars to produce generalisation. As aforementioned it was suspected that satiation (reflected by a decrease in the quality of the task, attractiveness of other tasks, emotional outbursts and expressions of dislike) may have set in (due to continual repetition of the video vignettes) during the first intervention. It was possible that participants were still satiated to the task the second intervention. This being the case, behaviours associated with satiation should be noted. The data and observational notes suggest participants only exhibited some of the behaviours Karsten (cited in James, 1962) associated with satiation. First, although P2 and P6 exhibited expressions of dislike and emotional outbursts (i.e. 'oh', or sighing), an increase was noted in correct responding for P2, in picture touching for P6, and P5 never exhibited any of the behaviours. If P5 was satiated to the task, then responses associated with satiation should have been noted (e.g., expressions of dislike). This finding is contrary to what might be expected had participants still been satiated to the task during Intervention 2. So the question might then be; could participants have been satiated to the task during Intervention 1 and not during Intervention 2. The answer to the question could quite simply be, yes. According to Karsten (in James, 1962), the effects of satiation can disappear if the meaning of the activity is altered through verbal instruction. For Intervention 2 participants in the oral comprehension condition were asked during the first (and most intrusive) verbal prompt to repeat answers back to the researcher (i.e. the researcher says to participant, "you say Saturday morning"). This instruction coupled with feedback and reinforcement may have been enough to prevent satiation during Intervention 2, but not enough to increase the target behaviour to the desired criterion. In relation to the emotional recognition condition no verbal instructions were given to the participants. Though, the instructions "touch the picture with the….face" and the prompting, reinforcement and feedback may have served a similar function.

In the case of generalisation (or lack there of) it is quite possible that generalisation did not occur (for the participants who responded correctly)

because insufficient exemplars were trained. Martin and Pear (2003) argue that it is important to train sufficient stimulus and response exemplars when programming for generalisation. In relation to the number of stimulus and response exemplars trained in this study, these were much the same as the number of those trained in previous research that successfully generalised the target behaviour. However, several factors that can influence the effectiveness of generalisation could have been considered more in this present study, when programming for generalisation. For example, the target behaviour could have been trained in several different situations (e.g., classroom, home, playground), further consideration could have been given to the number of examples of people exhibiting the targeted emotions or the number of stories and WHAT, WHEN, WHY, WHERE questions. Nevertheless, as previously mentioned generalisation training in this study corresponded to other studies; yet generalisation did not occur. Conceivably one explanation might be that this study resulted in more stimulus control then other VM studies. Martin and Pear (2003) state generalisation is more likely to occur if the behaviours are brought under the control of a variety of stimuli which might be present in the target situation. This Martin and Pear (2003) suggest might include not controlling for background stimuli such as playground or traffic noise. This present study was undertaken in an extremely well controlled setting and therefore behaviours might not have been brought under the control of a wide variety of stimuli. Nevertheless, this is speculative and because generalisation was tested across all three dimensions at once, it is hard to determine if generalisation failed because of the new setting, or whether it was a result of the two other dimensions tested (stimuli, person).

Although, none of the 6 participants generalised their target behaviour across the three measures 2 participants did reach the criterion following the training in at least one condition. So why did these 2 participants perform better then the other 4 participants? Of the 6 participants who took part in this study, the 1 participant who reached the criterion (without supplementary assistance) was ranked as enjoying the video vignettes the most out of all the participants. It is possible that the success of VM without supplementary assistance may be associated with how much a participant enjoys the VM vignettes. That is; VM is likely to be successful if the video functions as reinforcement for that participant. Even though this participant (P3) never reached the criterion for the peer

condition during Intervention 1; of all the participants this participant improved the most across both conditions then any other participant. Interestingly, this participant was also rated as enjoying both video vignettes equally. P4 was the only participant to reach the criterion in Intervention 2. Perhaps, this participant reached the criterion because the items selected for this intervention (computer time) functioned as reinforcement. It is possible that the participants who showed little improvement did not find the items selected for intervention reinforcing; no preference assessments were conducted with any of the participants; rather parents and/or teachers were asked to list suitable items for reinforcement.

Alternatively, there may also be some individual characteristics which make P3 and P4 suitable candidates for either VM or VM with assistance. Sherer et al. (2001) suggests that the visual learning abilities of participants may play a role in the successfulness of VM treatments. Sherer et al. (2001) provide reference to research that indicates individuals with autism excel in visual treatment approaches and that children with autism perform higher then age appropriate levels on memory tasks associated with sight words and visual symbols. Sherer et al. (2001) also notes that children with autism achieve higher IQ scores on tests of visuospatial ability then conventional tests. According to Sherer et al. (2001) observational data and informal parental interviews indicated that the participants who performed better in their study had extraordinary visual memories and preferred visual stimuli. This study also conducted similar observations and undertook semi-structured interviews (Appendix H) with both the parents and the teachers of each of the participants. One of the functions of the semi-structured interviews was to help determine whether the participants were thought to respond well to visual stimuli and whether they were believed to prefer visual stimuli over other types of stimuli. These interviews indicated that all participants were believed to respond well to visual stimuli but mixed results were found in response to the latter question. P3, P5 and P6 were all believed to respond well to music (audio stimuli), and P3 and P6 were thought to prefer audio stimuli over any other type of stimuli. P5 was thought to prefer visual stimuli (magazines, books, television) over other types of stimuli (including music) and for P3 and P6 visual stimuli (computers and books) followed music stimuli. P1 was thought to prefer hands on approaches according to the parental interview and visual approaches according to the teacher interview. The parental interview for P2 and

P4 indicated that these two participants preferred visual stimuli over other types of stimuli where as teacher interviews indicated that visual stimuli were equal in preference to other stimuli. Based on the findings from the semi-structured interviews conducted with the teachers and parents, one might expect to see P5 do the best and P3 and P6 do less well then the remaining participants. This was not the case. In order to resolve whether visual spatial ability is related to VM success, several tests would need to be done. First, a conventional test such as the Standford-Binet Intelligence scales (Thorndike, Hagen, & Sattler, 1986) would need to be undertaken followed by a test of visuospatial ability (e.g., Leiter Performance Scale, 1979). Then the two could be compared to see whether a) the participants IQ scores were higher on the visuospatial test and b) if they did score high on the Leiter Performance Scale, how this related to the success of the VM intervention. Unfortunately, due to time restraints and the unavailability of such tests, this line of questioning could not be followed.

Limitations and suggestions for future research

One limitation of the two studies presented here was that participants were tested across all three measures of generalisation. Subsequently, because generalisation did not occur for any of the participants it was hard to determine why it failed. If feasible, future studies should avoid combining the three measures. This would allow the researcher(s) to ascertain exactly why generalisation failed and permit them to make changes to improve the chances of generalisation. For example, if an individual successfully generalised the skill across person and stimuli, but not setting, the training situation could be varied to bring the behaviour under the control of a greater number of stimuli that would be present in the target setting. This would be impossible to determine if all three measures were combined. Additionally, because no pre-testing was conducted prior to undertaking the studies, it was not until after data collection and intervention that it was determined that the target behaviour for one participant may have been outside of their ability level. Moreover, even though the parents and the teachers indicated the participants had the pre-requisite skills for under taking a VM study (Appendix B), this was not measured directly. So it is possible that some participants did not have the pre-requisite skills. Therefore, a probe or pre-test would be recommended to test the skills considered important for VM

training (Appendix B), and to test the participant's current ability level of the target behaviour(s).

Given that video making had a slight positive effect on some of the participants' responses, this may also be considered a limitation. In hindsight it would have been wise to construct all the videos prior to baseline. This would have circumvented participants making an association between the questions asked in baseline, and the answers they were instructed to give during video making. However, an extended baseline occurred after video making, and intervention was not implemented until data was relatively stable, thus, any intervention effects could still be distinguished from video making effects. Future studies might plan to construct videos prior to collecting baseline data. This would avoid the present problem.

Another potential limitation could be that the ability level of P3's peer was not equivalent to P3's ability level during Intervention 2 and the settings shown on the video differed to the settings P3 experienced in vivo. Even though P3's correct responding dramatically increased following the new peer video, the criterion was not reached. It is possible that these two factors contributed to VPM's failure. If the video vignettes had been constructed prior to commencing baseline it would have been possible to ascertain the suitability of the participant for a peer video. As the videos were not created prior to baseline the researcher was not aware that one of the participants might not have been a suitable peer.

Another drawback of this current study was that it was not possible to determine whether supplementary assistance alone would have been effective for P4 as VM and supplementary assistance. Had this study included more participants it might have been possible to test this hypothesis by having some participants receive supplementary assistance following VM and others receive both.

Potential areas of value for future researchers to explore include; research to determine the types of target behaviours that are most appropriate for VM studies. Bellini and Akullian's (2007) meta-analysis explored intervention effects across three dependant measures (social-communicative skills, functional skills and behavioural functioning) and determined that there was no difference in outcome effects. However, there is a difference in the number of studies undertaken for each of the dependant variables. For example, only three studies

targeted behavioural functioning in comparison to 16 which targeted social-communicative functioning. Thus it appears premature to draw conclusions about the appropriate target behaviours until further VM research has been undertaken.

Future studies may also want to examine the individual characteristics of the participants used in VM studies. This study and several others according to Delano (2007), indicate that individual characteristics (e.g., visual processing skills, the rate of the challenging behaviour and expressive language skills) may be related to variable outcomes. The present study also revealed several other areas which may be worth investigating in relation to the success of VM. For example, gender, whether children with autism find television inherently motivating and the severity of the participants diagnoses.

Implications for practice.

The findings of these two studies may have implications for practitioners considering utilising VM methods with individuals with autism. First, the findings suggest VM alone may not increase correct responding for all individuals with autism. Second, to increase correct responding for some autistic individual's, reinforcement and prompting maybe needed to supplement VM. Third, a large amount of research is still required before VM (self or peer) can be unequivocally recognised as an evidence based method. Until research can answer many of the questions posed in this study and other VM studies, VM should not be considered a preferred method for individuals with autism; particularly when studies find contradictory results to the published studies. Specialists may consider turning to other validated methods whilst these issues are being resolved.

References

Alberto, P. A. & Troutman, A. C. (1982). *Applied behaviour analysis for teachers: Influencing student performance.* USA: Merrill Publishing Company.

American Psychiatric Association. (1994). *Diagnostic and Statistical Manual of Mental Disorders* (4th Ed.). Washington, DC: American Psychiatric Association.

Apple, A., Billingsley, A. F. & Schwartz, I. S. (2005). Effects of video modelling alone and with self-management on compliment-giving behaviours of children with high-functioning ASD. *Journal of Positive Behavior Interventions, 7(1),* 33-55.

Autism New Zealand Inc. *What are autism, asperger syndrome and autism spectrum disorders?* Retrieved April 15, 2006 from www.autismnz.org.nz/police/Pol_peopAutism.

Bandura, A. (1977). *Social Learning Theory*. Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. (1986). *Social Foundations of thought and action: A social cognitive theory.* Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: Freeman.

Bandura, A., Ross, D., & Ross, S. A. (1961). Transmission of aggression through imitation of aggressive models. *Journal of Abnormal and Social Psychology, 63*, 575-582.

Baron-Cohen, S. (1999). The extreme-male-brain theory of autism. In H. Tager-Flusberg (Eds.), *Neurodevelopmental disorders* (pp.1-68). UK: MIT Press.

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

Bellini, S. (2006). *Building Social Relationships: A systematic approach to teaching social interaction skills to children and adolescence with autism spectrum diosrders and other social difficulties.*USA: Autism Asperger Publishing Company.

Bellini, S, Akullain, J., & Hopf, A. (2007). Increasing social engagement in young children with autism spectrum disorder using video self-modeling. *School Psychology Review, 36(1),* 80-91.

Bellini, S., & Akullain, J. (2007). A meta-analysis of video modelling and video self-modeling interventions for children and adolescents with autism spectrum disorder. *Council for Exceptional Children, 73 (3).* 264-287.

Bidwell, M. A., & Rehfeldt, R. A. (2004). Using video modelling to teach a domestic skill with an embedded social skill to adults with severe mental retardation. *Behavioral Interventions, 19,* 263-274.

Blum, N. J., Kell, R. S., Starr, H. L., Lender, W. L., Bradley-Klug, K. L., Osbourne, M. L., & Dowrick, P. W. (1998). Case study: Audio feedforward treatment of selective mutism. *Journal of the American Academy of Psychiatry, 37(1),* 40-43.

Braaksma, M. A. H., Rijlaarsdam, G., & Bergh, H. V. D. (2002). Observational learning and the effects of model-observer similarity. *Journal of Educational Psychology, 94(2),* 405-415.

Bray, M. A., Kehle, T. J. (2001) Long-term follow-up of self-modeling as an intervention for stuttering. *School Psychology Review*, *30(1),* 135-141.

Britannica Concise Encyclopaedia (2007). *Habituation.* Retrieved June 11, 2007, from http://answers.com/topic/habitutation.

Buggey, T. (2005). Video self-modeling applications with students with autism spectrum disorder in a small private school setting. *Focus on Autism and other Developmental Disabilities, 20(1),* 52-63.

Buggey, T., Toomes, K., Gardener, P., & Cervetti, M. (1999). Training responding behaviors in students with autism: Using videotaped self-modeling. *Journal of Positive Behavior Interventions, 1(4),* 205-214.

Carr, A. (2006). *The handbook of child and adolescent clinical psychology: A contextual approach* (2nd ed.). Routledge: New York.

Carter, A. S., Black, D. O., Tewani, S., Connolly, C. E., Kadles, M. B., & Tager-Flusberg, H. (2007). Sex differences in toddlers with autism spectrum disorders. *Journal of Autism and Developmental Disorders, 37,* 86-97.

Carter, E. W., Cushing, L. S., Clark, N. M., & Kennedy, C. H. (2005). Effects of peer support interventions on student's access to the general curriculum and social interactions. *Research and Practice for Persons with Severe Disabilities, 30(1),* 15-25.

Cass, M. (2001). Videotaped self-monitoring to change inappropriate behaviour by comparing two programs: Positive only behaviour videotapes with positive and negative behaviour videotapes. *Introduction to graduate research, Education 5103,* Cameron University.

Charlop-Christy, M. H., Carpenter, M. H., & Dennis, B. (2001). *Using video modeling to teach appropriate social commenting with appropriate facial expressions, gestures, and intonation to children with autism.* Paper presented at the APA conference, San Francisco.

Charlop-Christy, M. H., & Daneshvar, S. (2003). Using video modelling to teach perspective taking to children with autism. *Journal of Positive Behavior Interventions, 5(1),* 12-21.

Charlop-Christy, M. H., Le. L., & Freeman, K. A. (2000). A comparison of video modeling with in vivo modeling for teaching children with autism. *Journal of Autism and Developmental Disorders, 30(6),* 537-552.

Charlop, M. H. & Milstein, J. P. (1989). Teaching autistic children conversational speech using video Modeling. *Journal of Applied Behaviour Analysis, 22(3),* 275-285.

Cooper, J. O., Heron, T. E., & Heward, W. L. (1987). *Applied Behavior Analysis*. USA: Merrill Publishing Company

Corbett, B. A. (2003). Video modeling: A window into the world of autism. *Behaviour Analyst Today, 4(3),* 88-96.

Corbett, B. A., & Abdullah, M. (2005). Video modeling: Why does it work for children with autism? *Journal of Early and Intensive Behavior Interventions, 2(1),* 2-8.

Coyne, J, C., Stefanek, M., Palmer, S, C. (2007). Psychotherapy and survival in cancer: The conflict between hope and evidence. *Psychological Bulletin, 133(3),* 367-394.

D'Ateno, P., Mangiapanello, K., & Taylor, B. A. (2003). Using video modelling to teach complex play sequences to preschoolers with autism. *Journal of Positive Behavior Interventions, 5(1), 5-11.*

Davis, M. A. (2004). *The effects of an augmented self-modeling intervention on the on-task and off-task classroom behaviours of students with developmental disabilities.* Unpublished doctoral dissertation, University of Central Arkansas, Conway, USA.

Delano, M. E. (2007). Video modeling interventions for individuals with autism. *Remedial and Special Education, 28(1),* 33-42.

Dempsey, I., & Foreman, P. (2001). A review of educational approaches for individuals with autism. *International Journal of Disability, Development and Education, 48(1),* 103-112.

Dowrick, P. W. (1999). A review of self-modeling and related intervention. *Applied and Preventive Psychology, 8,* 23-39.

Dowrick, P. W., Power, T. J., Manz, P. H., Ginsburg-Block, M., Leff, S. S., Kim-Rupnow, S. (2001). Community-responsiveness: Examples from under-resourced urban schools. *Journal of Intervention and Prevention, 21(2),* 71-90.

Gena, A., Couloura, S., & Kymissis, E. (2005). Modifying the affective behaviour of preschoolers with autism in-vivo or video Modeling and reinforcement contingencies. *Journal of Autism and developmental Disabilities, 35(5),* 545-556.

Gerull, F. C., & Rapee, R. M. (2002). Mother knows best: Effects of maternal modeling on the acquisition of fear and avoidance behaviour in toddlers. *Behaviour Research and Therapy, 40(3),* 279-287.

Goldsmith, T. R. & LeBlanc, L. A. (2004). Use of technology in interventions for children with autism. *Journal of Early and Intensive Behaviour Intervention, 1(2),* 166-178.

Graetz, J. E., Mastropieri, M. A., & Scruggs, T. E. (2006). Show time: Using video self-modeling to decrease inappropriate behaviour. *Teaching exceptional children, 38(5),* 43-48

Haring, T. G., Breen, C. G., Weiner, J., & Kennedy, C. H. (1995). Using videotape Modelling to facilitate generalised purchasing skills. *Journal of Behavioral Education, 5(1)*, 29-53.

Haring, T G., Kennedy, C. H., Adams, M. J., & Pitts-Conway, V. (1987). Teaching generalisation of purchasing skills across community settings to autistic youth using videotape modeling. *Journal of Applied Behaviour Analysis, 20(1),* 20- 89.

Harris, S. L. (2004). Autism Intervention. In R. E. Tremblay., R. G. Barr., R. D. Peters (Eds.) [electronic version], *Encyclopaedia on Early Childhood Development.* Retrieved April 15, 2006 from.www.excellence*earlychildhood.ca/documents/HarrisANGxp.pdf.*

Hine, J. F., & Wolery, M. (2006). Using point-of-view video modeling to teach play to preschoolers with autism. *Topics in Early Childhood Special Education, 26(2),* 83-93.

Hitchcock, C. H., Dowrick, P. W., & Prater, M. A. (2003). Video self-modeling intervention in school-based settings. *Remedial and Special Education, 24(1),* 36-45.

Hitchcock, C. H., Prater, M A., Dowrick, P. W. (2004). Reading comprehension and fluency: Examining the effects of tutoring and video self-modeling on first-grade children with reading difficulties, *Learning Disability Quarterly, 27(2),* 89-103.

Honda, H., Shimizu, Y., Imai, M., & Nitto, Y. (2005). Cumulative incidence of childhood autism: A total population study of better accuracy and precision. *Developmental Medicine and Child Neurology, 47,* 10-18.

James, L. J (1962). *Effects of repeated stimulation on cognitive aspects of behaviour some experiments on the phenomenon of semantic satiation.* Unpublished doctoral dissertation, McGill University, Montreal.

Jesdale, D, C. & Dowrick, P. W. (1991). Modeling. In P. W. Dowrick and associates (Ed.), *Practical Guide to using Video in the Behavioral Sciences*. New York: Wiley Interscience.

Kehle, T. J. & Gonzales, F. (1991). Self-modeling for children's emotional and social concerns. In P. W. Dowrick and associates (Ed.), *Practical Guide to using Video in the behavioral sciences.* New York: Wiley Interscience.

Kinney, E. M., Vedora, J., & Stromer, R. (2003). Computer-presented video models to teach generative spelling to a child with an autism spectrum disorder. *Journal of Positive Behavior Interventions, 5(1),* 22-29.

Krantz, P. J. MacDuff, G. S., Wadstrom, O., McClannahan, L. E (1991). Using video with developmentally disabled learners. In P. W. Dowrick and associates (Ed.). *Practical Guide to using Video in the Behavioral Sciences.* New York: Wiley Interscience.

LeBlanc, L. A., Coates, A. M., Daneshvar, S., Charlop-Christy, M. H., Morris, C., & Lancaster, BM. (2003). Using video modelling and reinforcement to teach perspective taking skills to children with autism. *Journal of Applied Behavior Analysis, 36(2),* 253-257.

Lieberman, D. A. (1993). *Learning, Behavior and cognition* (2nd ed.). California: Brooks/Cole Publishing Company.

Leiter, R. G. (1979). *Leiter International Performance Scale: Instruction manual.* Chicago: Stoelting.

Lord, C., Schopler, E., & Revicki, D. (1982). Sex differences in autism. *Journal of Autism and Developmental Disorders, 12(4),* 317-330.

MacDonald, R., Clark, M., Garrigan, E., & Vangala. (2005). Using video modeling to teach pretend play to children with autism. *Behavioral Interventions, 20,* 225-238.

Maione, L., & Mirenda (2006).Effects of video modeling and video feedback on peer-directed social language skills of a child with autism. *Journal of Positive Behavior Interventions, 8,* 106-118.

Martin, G., & Pear, J. (2003).*Behavior modification: What it is and how to do it* (7th ed.). USA: Prentice-Hall.

McBurney, D. H. (2001).*Research Methods* (5th ed.) USA: Wadsworth Thomson Learning.

Merriam-Webster Online. (2005). *Habituation*. Retrieved June 11, 2007, from http://www.Merriam-Webster.com.

Murzynski, N. T., & Bourret, J. C. (2007). Combining video modeling and least-to-most prompting for establishing response chains. *Behavioral Interventions, 22,* 147-152.

Nikopoulos, C. K., & Keenan, M. (2004a). Effects of video modeling on social initiations by children with autism. *Journal of Applied Behavior Analysis, 37, 1,* 93-96.

Nikopoulos, C. K., & Keenan, M. (2004b). Effects of video modeling on training and generalisation of social initiation and reciprocal play by children with autism. *European Journal of Behavior Analysis, 5(1),* 1-13.

Pierce, K. L., & Schreibman, L. (1994). Teaching living skills to children with autism in unsupervised settings through pictorial self-management. *Journal of Applied Behavior Analysis, 27,* 471-478.

Poling, A., Methot, L. L., & LeSage, M. G. (1995). *Fundamentals of Behavior Analytic research.* USA: Plenum Press.

Rehfeldt, R. A., Dahman, D., Young, A., Cherry, H., & Davis, P. (2003) Teaching a simple meal preparation skill to adults with moderate and severe mental retardation using video modeling. *Behavioral Interventions, 18(3),* 209-218.

Robertson, J., Green, K., Alper, S., Schloss, p. J., and Kohler, F. (2003). Using peer-mediated intervention to facilitate children's participation in inclusive childcare activities. *Education and Treatment of Children, 26(2),* 182-197.

Rosenthal, R. (1979). The "file drawer problem" and tolerance for null results. *Psychological Bulletin, 86(3),* 638-641.

Rosenthal, R. (1995). Writing meta-analytic reviews. *Psychological Bulletin, 118(2)*, 183-192.

Santini, M. E. (2007). *The impact of self-modeling vs. video-modeling on conversational skills with adolescent students with severe disabilities.* Unpublished doctoral dissertation, Brigham Young University, USA.

Schunk, D. H. (1987). Peer models and children's behavioral change. *Review of Educational Research, 57(2),* 149-174.

Sherer, M., Pierce, K. L., Paredes, S., Kisacky, K. L., Ingersoll, B., & Schreibman, L. (2001). Enhancing conversation skills in children with autism via video technology: Which is better, 'self' or 'other' as a model? *Behavior modification, 25(1),* 140-158.

Shipley-Benamou, R., Lutzker, J. R., & Taubman, M. (2002). Teaching daily living skills to children with autism through instructional video modeling. *Journal of Positive Behavior Interventions, 4(3),* 165-175.

Sturmey, P. (2003).Video technology and persons with autism and other developmental disabilities. *Journal of Positive Behavior interventions, 5 (1),* 3-4.

Tawney, J. W. & Gast, D. L. (1984). *Single subject research in special education.* USA: Merrill Publishing Company.

Taylor, B. A., Levin, L., & Jasper, S. (1999). Increasing play-related statements in children with autism toward their siblings: Effects of video modeling. *Journal of Developmental and Physical Disabilities, 11(3),* 253-264.

Thorndike, R. L., Hagen, E. P., & Sattler, J. M. (1986). *The Stanford-Binet Intelligence Scales* (4th ed.). Chicago: Riverside.

Utley, C. A., & Mortweet, S. L. (1997). Peer-mediated instructions and interventions. *Focus on Exceptional Children, 29(5).*

Volkmar, F. R., Szatmari, P., & Sparrow, S. S. (1993). Sex differences in pervasive developmental disorders. *Journal of Autism and Developmental Disorders, 23(4),* 579-591.

Walter, R. A. (1995). Enhancing psychomotor skill development through the use of mental practice. *Journal of industrial teacher education, 32(4).*

Weiner, J. S. (2005). Peer-mediated conversational repair, in students with moderate and severe disabilities. *Research and Practice for persons with Severe Disabilities,* 30(1), 26-37.

Wert, B. Y., Caldwell, N. K., & Wolery, M. (1996). Peer modelling of response chains: Observational learning of students with disabilities. *Journal of Applied Behavior Analysis, 29,* 53-66.

Wert, B. Y. & Neisworth, J. T. (2003).Effects of video-self-modeling on spontaneous requesting in children with autism. *Journal of Positive Behaviour Interventions, 5(1),* 30-34.

White, H. R., Johnson, V., & Buyske. (2002). Parental modelling and parenting behaviour effects offspring alcohol and cigarette use: a growth curve analysis. *Journal of Substance Abuse, 12(3),* 287-310.

Wikipedia (2007). *Habituation.* Retrieved June 11, 2007, from http://www.wikipedia.org/wiki/habitutation.

Williams, S. (2004, March 31). Head games: the use of mental rehearsal to improve performance. *Leaderletter.* Retrieved October 19, 2007 from http://www.wright.edu/~scott.williams/LeaderLetter/rehearsal

Appendix A

Letter to the principal of the school; this requested potential participants.

To whom it may concern

I am writing this letter to request permission to conduct a training project as a requirement of my psychology Masters Thesis with your school. This training project will be conducted under the supervision of Mary Foster and James McEwen. This research will require the participation of several students who are enrolled at your school. As part of the university regulations I am required to obtain permission from either the board of trustees or directly from the principal. These regulations require that initial contact with parents of participants must come from the school rather then from me. Please find enclosed a copy of the research intentions and other information to assist you in determining whether you would like to be a part of this research. The information sheet enclosed also outlines what assistance the school will need to supply to make this research successful. This includes the support of teachers and anyone else such as teacher aids who work closely with the child. Information regarding the criteria for inclusion in the research is also supplied on the page labelled ‘checklist’. A letter, information sheet and consent form is also enclosed to be forwarded to families that you decide may benefit from this training project. Thank you for taking the time to read both my letter and the supplementary information, I will be in contact shortly to confirm your decision. Alternatively you can contact me on the number or mailing address supplied.

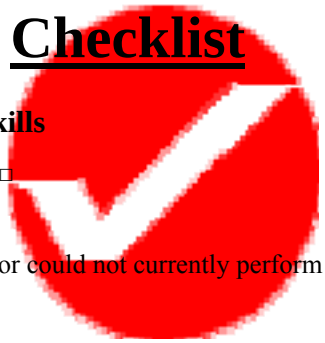
Yours Faithfully

Jasmine Koretz

Appendix B

Checklist of pre-requisite skills required for participation and a list of potential target behaviours

Checklist



Participant pre-requisite skills

Has been diagnosed with autism □

Can follow simple instructions□

Has some verbal language skills/or could not currently perform at least one of the target behaviours □

Can imitate the behaviour of others □

Has self-recognition □

Responds well to visual material□

Finds television motivating (as opposed to aversive) □

Target behaviour selection

The child must have a deficit in one or more of the following areas:

Conversation skills: The child cannot accurately and independently answer questions about their home or school life or the child does not independently ask questions of another person.

Emotions: The child cannot label the different emotions (such as happy, sad, angry afraid) or cannot demonstrate the different emotions using facial gestures.

Spontaneous greetings: This child does not use greetings when someone arrives or exits a situation.

Oral comprehension: Given a three sentence story the child cannot answer what, where, why and when questions.

Independent play: The child does not independently play by themselves when required too.

Co-operative and social play skills: The child does not engage in social games appropriately with others.

Pretend Play: This child does not use pretend play when toys are made available. For example, given a boat and a pirate the child will not make appropriate verbalisations or actions with the toy (Such as 'arch me matey', or gets a sword for the pirate to play with).

Daily living skills: The child is hindered in some way because they cannot perform certain daily tasks needed to function effectively. (e.g., brushing teeth, washing face, getting lunch out of school bag, table setting, putting toys away and pet care).

Appendix C

Information sheet for the principal and/or board of trustees, this outlined what the study was about and what participation involved for the school.

Information Sheet for principal and/or BOD

What the studies are saying:

As you may already be aware there can be many challenges to teaching individuals with autism. Your school may have already explored a variety of different methods to assist autistic children to develop certain skills that are essential for them to function effectively at home, in their school environment and even in the community. One area of study that has been become of recent interest to the scientific, teaching and parental community is the use of video technology to teach skill acquisition. Video modelling has shown great potential for teaching a whole range of behaviours including thematic pretend play, conversation skills, spontaneous greetings, social play and daily living skills. This method has involved several configurations including videoing the child (self-modelling), a similar peer (peer modelling), or adult doing the target behaviour. This is typically done by using a script and then editing out unwanted behaviours and extra information. Alternatively, if the child can not follow instructions or a simple scripts then the child can be videoed in their natural or in a contrived environment and sequences of behaviour can be edited together to create a video that depicts the child engaging in the target behaviour; even though in reality the child may have not done that sequence of behaviour. The child then watches the videotapes of the target behaviour being performed. According to the large amount of literature available on this technique, this method has shown substantial improvements in the behaviours that have been targeted for intervention.

Why do you think this method will be effective with autistic children at our school?

Studies suggest that video modelling is effective with individuals with autism because it takes into account their characteristic behaviour. That is; individuals with autism are said to learn visually, find television motivating and benefit from visual information more then verbal information.

If studies already show video modelling is effective then why undertake another study?

Although video modelling has been shown to be effective with individuals with autism, few studies have been undertaken to determine which type of video modelling is most effective with this population. Findings show that similarity between the model and the target individual results in better imitation and thus behaviour change. This tells us that peer models are better then adult models, but it does not tell us whether a video depicting the child (self-modelling) is more or less effective then a video depicting a similar peer.

What is the purpose of this training project?

This project is part of my Masters Thesis and the purpose is to assess which is the best video modelling method to use with individuals diagnosed with autism. That is; whether video peer modelling or self modelling is more effective. Additionally, this means improving a specific behaviour for the participants of this project.

What will participation involve for the participants?

Participation will involve the selected children being individually video recorded in their school or home environment (depending on the target behaviour) for short periods of time once a day, to determine how often the target behaviour occurs. This may involve asking the participants several questions (in the case of improving conversation skills, oral comprehension or labelling emotions), videoing them playing with toys (for thematic pretend play) or in their natural environment (for spontaneous greetings), or videoing them performing daily living skills (such as brushing teeth). After this initial observation the participants will then be required to either follow a script while being recorded (this is to create the actual intervention video), or the videos that were originally created determining the frequency of the target behaviour, will be edited together, creating the intervention video.

What will participation mean for the school?

The school will need to make the first contact with parents of potential participants. A letter, an information sheet and a consent form will be supplied to the school, which will then need to be forwarded to those families that might be appropriate for this project. Depending on the target behaviour selected (this will be determined by a structured interview used with both parents/caregivers of the participants and their teacher) a room for the intervention may need to be supplied by the school and possibly some furnishings such as table and chair. Further, the study may require some of the teacher's time (for example, participating in the structured interview). However, time will be kept to a minimum and every effort will be undertaken to ensure that no students or participants education will be hindered by the study.

What are the pre-requisite skills the children need to have?

They must have been diagnosed with autism, be able to follow simple instructions, have self-recognition, have some verbal language skills, can imitate the behaviour of others and find television reasonably reinforcing (not aversive). The target behaviour for the intervention will be determined by the structured interview that will be undertaken with the teacher and the participant's family. A list of the target behaviours that will be considered in this study will be supplied to the relevant person at the school. Therefore, participants must have a deficit in at least one of these target area's to be considered for this project. (See the checklist supplied)

How will the children benefit from participating in the study?

The target behaviour selected for this study will be a behaviour that the child cannot readily perform at the desired level. The target behaviour will be one that is of functional importance to the family, the child and most likely the school. That is; it will be a behaviour that will assist the child in certain aspects of their life.

What are the target behaviours that might be selected?

- Conversation skills,

- Expressive labelling of emotions
- Spontaneous greetings
- Oral comprehension
- Independent play
- Daily living skills
- Co-operative, social and pretend play skills

Will it cost the school or participants anything?

There is no monetary cost, only time during the sessions.

What will happen to the information collected?

The results of the project will be provided to parent on the completion of the project. A face to face meeting will be arranged with parent to discuss results, answer questions and a brief write-up for future reference will also be supplied. Intervention videos of the child will be given to the parents to dispose of. Other videos recordings taken of the children will be kept for no longer then a period of a year and then disposed of. All identifying data such as consent forms shall also be disposed of. Pseudo names will also be used in this study to prevent identification. On the request of the school a brief overview of the findings may also be supplied. Please feel free to discuss any aspect of the study with me.

Where can I get further information?

If you think that there may be some suitable candidates at your school please forward the consent forms, information sheet and letter to the appropriate families. I will be in contact with you shortly. Alternatively, you can contact me (Jasmine) on (07) 853XXXX, email jmk17@waikato.ac.nz if you have any further queries.

Thank you

Jasmine Koretz

Appendix D

This is a letter to parents/caregivers requesting permission for their child to participate in the study.

Dear parent(s)/caregiver(s)

My name is Jasmine Koretz and I am a student at The University of Waikato. I am looking for children diagnosed with autism to take part in a supervised training project as part of my Masters thesis. I have been in touch with your child's school and have asked them to make initial contact with families (such as yourself) that may be interested in partaking in this project. I have requested that the school send out this letter, an information sheet and a consent form. The intention of this training project is to not only generate valuable information for the scientific community but also to provide a method to improve a target behaviour that your child may be struggling with. I am optimistic that this project may be able to help your child improve on a specific behaviour such as communication, social interactions, emotions, greetings and daily living skills. Therefore, this project may make both your life and your child's life a little easier. If this sounds like something you may be interested in, please read the information sheet provided which outlines what the research is about and send the consent form back to the school. Alternatively, if you have any questions contact the school and tell them you are interested and I will collect the consent form after answering any questions you may have. I will be in touch with the school to find out those families that are interested in being part of this project. On receiving the consent form back or acknowledgement of your interest I will make contact with you to arrange a meeting to discuss the project further. This meeting may be conducted face to face or over the phone, which ever is more convenient for you.

Thank you for taking the time to read this letter, I eagerly await your response.

Jasmine Koretz

Appendix E

Consent form for parents/caregivers to fill out indicating permission for their child to participate in the study

CONSENT FORM

Researcher or Participant Copy

Research project: Video modelling: peer versus self.

Researcher: Jasmine Koretz **Supervisor:** Mary Foster

I have received an information sheet about this training project or the researcher has explained this training project to me. I have had the chance to ask any questions and discuss my participation with other people. Any questions have been answered to my satisfaction.

I agree to either meet with the researcher to establish the target behaviour appropriate to my child or have a telephone interview. I also agree to allow my child's teacher to be asked questions about behaviour appropriate for this training. Furthermore, I am aware that this training project will not be discussed with anyone except the researcher's supervisors and relevant school staff. Additionally, I am aware that confidentiality will be maintained at all times by the researcher and pseudo names will be used in the information that will be made publicly available. I am aware that my child will be videoed and that these videos may be used to show other participants for the purpose of the peer element of this study. I agree to participate in this training project and I understand that I may withdraw at anytime. If I have any concerns about this project, I may contact the convenor of the research and ethics committee (Dr Robert Isler, phone: 838 #### ext. 8###, email r.isler@waikato.ac.nz or the supervisor Mary Foster on ext 8400).

Participants Name: …… Signature: ……Date:……

Appendix F

Information sheet for the parents/caregivers, this outlined what the study was about and what participation involved for their child and themselves.

Information Sheet for Parents and Caregivers

What the studies are saying:

As you may already be aware there can be many challenges to teaching individuals with autism. You may have already explored a variety of different methods to assist your child to develop certain skills that are essential for them to function effectively at home, in their school environment and even in the community. One area of study that has been become of recent interest to the scientific, teaching and parental community is the use of video technology to teach skill acquisition. Video modelling has shown great potential for teaching a whole range of behaviours including thematic pretend play, conversation skills, spontaneous greetings, social play and daily living skills. This method has involved several methods including videoing the child (self-modelling), a similar peer (peer modelling), or adult doing the target behaviour. This is typically done by using a script and then editing out unwanted behaviours and extra information. Alternatively, if the child can not follow instructions or a simple scripts then the child can be videoed in their natural or in a contrived environment and sequences of behaviour can be edited together to create a video that depicts the child engaging in the target behaviour; even though in reality the child may have not done that sequence of behaviour. The child then watches the videotapes of the target behaviour being performed. According to the large amount of literature available on this technique, this method has shown substantial improvements in the behaviours that have been targeted for intervention.

Why do you think this method will be effective with my child?

Studies suggest that video modelling is effective with individuals with autism because it takes into account their characteristic behaviour. That is; individuals with autism are said to learn visually, find television motivating and benefit from visual information more then verbal information.

If the studies already show video modelling is effective then why undertake another study?

Although video modelling has been shown to be effective with individuals with autism, few studies have been undertaken to determine which type of video modelling is most effective with these children. Findings show that similarity between the model and the target individual results in better imitation and thus behaviour change. This tells us that peer models are better then adult models, but it does not tell us whether a video depicting the child (self-modelling) is more or less effective then a video depicting a similar peer.

What is the purpose of this training project?

This project is part of my Masters Thesis and the purpose is to assess which is the best video modelling method to use with individuals diagnosed with autism. That is; whether video peer modelling or self modelling is more effective.

What will participation involve for me?

You will need to give consent for your child to participate and participate in a meeting with the researcher.

What will participation involve for my child?

Participation will involve me video recording your child in an appropriate setting (in their school or home environment) for short periods of time, once a day, during the week, to determine how often the target behaviour occurs. This may involve asking your child several questions (in the case of improving conversation skills, oral comprehension or labelling emotions), videoing them playing with toys (for thematic pretend play) or in their natural environment (for spontaneous greetings), or videoing them performing daily living skills (such as brushing teeth). After this initial observation the child will then be required to either follow a script while being recorded (this is to create the actual intervention video), or the

videos that were originally created determining the frequency of the target behaviour, will be edited together, creating the intervention video.

Who will see the videos?

The videos may be seen by teachers, research assistants, supervisors and other participants. Other child participants may see the video as part of the 'peer' component of the study. The use of the video of your child for the 'peer' component will be dependant on whether the child is similar in age, gender and ability to the other participants (if you have any questions about this please do not hesitate to ask).

What are the pre-requisite skills my child needs to have?

Your child must have been diagnosed with autism, have self-recognition, some verbal skills, can follow simple instructions, can imitate others and find television reasonably reinforcing (not aversive). These pre-requisite skills and the target behaviour for the intervention will be determined by the meeting that shall be arranged between you and I (face to face or over the telephone). In this meeting I will ask you several questions about behaviours your child can and cannot do and allow you to ask any questions you may have (please see the next question for the target behaviour selection). Your child's teacher will also be asked similar questions (with your permission).

What are the target behaviours?

- Conversation skills,
- Labelling of emotions
- Spontaneous greetings
- Oral comprehension
- Independent play
- Daily living skills
- Co-operative, social and pretend play skills

How will my child benefit from participating in this project?

The target behaviour selected for this project will be a behaviour that your child cannot readily perform at the desired level. The target behaviour will be one that

is of functional importance to you and your child. That is; it will be a behaviour that will assist you and your child in certain aspects of life.

Will it cost me anything?

There is no monetary cost, only time during the sessions. You will not be required to spend any extra time beyond the session times that will be allocated.

Can we withdraw from the study?

You may withdraw at anytime for any reason.

What will happen to the information collected?

The results will be provided to you on the completion of the project. A face to face meeting (or over the telephone) will be arranged with you to discuss results and answer questions, a brief write-up for future reference will also be supplied. Intervention videos of your child will be given to you to dispose of as you choose. Other video recordings taken of your child will be kept for no longer then a period of a year and then disposed of. All identifying data such as consent forms shall also be disposed of. Pseudo names will also be used in this study to prevent identification. Please feel free to discuss any aspect of the study, including your child's progress at any time.

Where can I get further information?

If you would like further information about this project please contact me (Jasmine) on (07) 853XXXX, email jmk17@waikato.ac.nz or my Supervisors.

Appendix G

Reminder letter to parents/caregivers to send in their signed consent forms.

Dear parent(s)/caregiver(s)

Recently you should have received a letter of introduction, an information sheet and a consent form from your School. This information was in relation to a training project with children diagnosed with autism, which is part of a Masters project at The University of Waikato. This is just a friendly reminder to get in touch with your child's school and to send in your consent form to the school if you would like your child to be part of this exciting project which is starting very shortly. Just to refresh your memory this project will focus on a specific target behaviour that your child may find difficult. For instance, some of the behaviours I am interested in include; communication, social interactions, emotions, greetings and daily living skills.

I will be in touch with the school shortly to find out if you are interested in your child being part of this project. On receiving the consent form back or acknowledgement of your interest I will make contact with you to arrange a meeting to discuss the project further. This meeting may be conducted face to face or over the phone, which ever is more convenient for you.

Please do not hesitate to contact myself or my supervisors if you have any queries about this project, I am more then happy to help.

Regards

Jasmine Koretz

Appendix H

Structured Interview completed with the parents and/or teachers of the research participants to determine if the participants had the pre-requisite skills to participate and which target behaviours were applicable to the child.

Personal details

Name:

Relationship to the child:

Address: Phone/Email:

Name of child:

Childs age:

1. Pre-requisite skills

1.1 Simple scripts depicting a set of behavioural tasks may be utilised in this training project. Can this child follow simple instructions?

Yes ☐ No ☐

……
……
……
……
……

1.2 Does this child have some verbal language skills?

Yes ☐ No ☐

……
……
……
……
……

1.3 Can this child imitate the behaviour of others?

Yes ☐ No ☐

……
……
……
……
……

1.4. Does this child have self-recognition; that is, if they watch a video of themselves do they understand that the person on the video is them?

Yes ☐ No ☐

……
……
……
……
……

1.5. Does this child respond well to visual materials such as television?

Yes ☐ No ☐ If Yes, please answer the following:

……
……
……
……
……

1.6. Does this child seem to prefer visual learning material (DVD, video, television, books etc.) over other types of material for learning such as verbal instruction and prompting?

Yes ☐ No ☐

……
……
……
……
……

2. Target behaviour

The following list is designed to establish what target behaviours may be appropriate for focus in this training project. The aim is to determine whether the behaviours listed are <u>not</u> currently being preformed by your child at the desired level.

2.1. Do you feel this child's conversations skills need to be improved?

Yes ☐ No ☐ If Yes please answer the following two questions

……
……
……
……
……

2.1 a. Can this child correctly and with no assistance answer questions about their home, personal or school life? *(For example, when asked questions such as what are your favourite games, who do you sit next to in class or what do you like to eat for breakfast, the child can give the appropriate response without prompting).*

Yes ☐ No ☐ If No please circle the following examples that the child <u>cannot</u> answer questions too.

Home School Personal

……
……
……
……
……

2.1b. Can this child independently asks questions of others (regardless of whether they have just responded to a question provided by someone else).
(An important part of having a conversation is being able to keep the conversation going. This means both parties playing a role as both the speaker and the listener).

Yes ☐ No ☐

……
……
……
……
……

2.2. Can this child label emotions?
(For example, when shown a picture of different emotions such as happy, sad, and angry and asked "what is it" the child can respond correctly).

Yes ☐ No ☐ If No please provide some examples of those emotions you are aware that your child does not expressively label.

……
……
……
……
……

2.3. Can this child, when asked, use facial gestures to demonstrate certain emotions?
(For example, when asked show me sad the child use's the appropriate facial gestures).

Yes ☐ No ☐

……
……
……
……
……

2.4. Can this child use spontaneous greetings?
(For example, when someone enters the room this child says "hello. How are you" or when a person is leaving this child says "good-bye. See you later").

Yes ☐ No ☐ If No please circle the types of greetings this child does not use

Arrival greetings leaving greetings

……
……
……
……
……

2.5. Can this child, given a three sentence verbal story, answer questions related to the story?
(For example, answer what, when, why and where questions)

Yes ☐ No ☐ If No please circles those the child cannot answer

What When Where Why

……
……
……
……
……

2.6. Does this child need to enhance their cooperative and social play skills?

Yes ☐ No ☐ If Yes please list any games that might be of value for the child to learn

……
……
……
……
……

2.7. Can this child play by themselves when required for a period of at least four-five minutes?

Yes ☐ No ☐

……
……
……
……
……

2.8. Does this child use pretend play when toys are made available to them?

Yes ☐ No ☐ If Yes please answer the following question

……
……
……
……
……

2.9. Are the play situations that the child displays appropriate for the toys that are available?

Yes ☐ No ☐

……
……
……
……
……

3.0. When given a toy such as a doll or action man, does this child make verbalisations for the toy?

Yes ☐ No ☐

……
……
……
……
……

3.1. Are there daily living skills that your child's cannot do?
(For example, getting dressed, brushing teeth, making sandwiches, washing face, pet care, and table setting).

Yes ☐ No ☐ If Yes please supply some examples in the space provided

……
……
……
……
……

Date:_____

Appendix I

Example of notice seeking student to assist with videoing sessions, posted in the psychology and media departments.

PSYCHOLOGY STUDENT WANTED!!

Psychology student wanted to assist a Masters student in a training project for her thesis.

- Would you like to gain practical insight and experience into how data collection can be undertaken for a Masters Project?
- Do you enjoy using video equipment and have basic know how of operating a video camera?
- Are you interested in learning about video modelling as a teaching method with children diagnosed with autism?
- Are you available for approximately 1-1 ½hrs Monday to Friday for about 10-15 weeks?
- The right applicant will receive koha for their assistance

If you answer yes to the aforementioned, then give Jaz a call on 07 85XXXXX or 021XXXXXXX for more information

Appendix J

Oral comprehension data collection form used during Intervention 1 phases.

Person filling out form…… Name of participant---------- Training Type: *Oral comprehension*

Date	Condition (circle)	Story 1,2 ,3, 4, 5	Correct (C), Incorrect (IC), Non-response (NR)					Correct (C), Incorrect (IC), Non-response (NR)			
			When	Actual response	Why	Actual response	Total %	What	Actual response	Where	Actual response
	Baseline										
	Peer Video										
	Self Video										
	Follow-up										
	% Correct										
	Generalisation										

Date	Condition (circle)	Story 1,2 ,3, 4, 5	Correct (C), Incorrect (IC), Non-response (NR)					Correct (C), Incorrect (IC), Non-response (NR)			
			When	Actual response	Why	Actual response	Total %	What	Actual response	Where	Actual response
	Baseline										
	Peer Video										
	Self Video										
	Follow-up										
	% Correct										
	Generalisation										

Appendix K

Example of pictures used for the emotional recognition condition

ANGRY HAPPY

SURPRISED SCARED

DISGUSTED SAD

Appendix L

Emotional recognition data collection form used across Intervention 1 phases.

Person filling out form………………… Name of participant……………….Training Type:…………

Day and date	Session	Condition (circle)	Set 1, 2, 3, 4	Set A: Correct (c), Incorrect (IC), Non-response (NR)			Total % Correct	Set B: Correct (c), Incorrect (IC), Non-response (NR)		
				Happy	Scared	Disgusted		Sad	Surprised	Angry
		Baseline / Follow-up								
		Peer video								
		Self video								
		% Correct								
		Generalisation								
		Person / Setting / Expression								
		Baseline / Follow-up								
		Peer video								
		Self video								
		% Correct								
		Generalisation								
		Person / Setting / Expression								
		Baseline / Follow-up								
		Peer video								
		Self video								
		% Correct								
		Generalisation								
		Person / Setting / Expression								
		Baseline / Follow-up								
		Peer video								
		Self video								
		% Correct								
		Generalisation								
		Person / Setting / Expression								

Appendix M

Treatment fidelity questionnaire used to determine procedural reliability and participant preference across the different VM procedures and studies.

Treatment Fidelity Questionnaire

Part A.

Ratings

On a scale of 1-5 (1=Never, 2=Hardly ever, 3=Sometimes 4=Most of the time, 5=All the Time)

Oral Comprehension	**1**	**2**	**3**	**4**	**5**
The same steps/processes were undertaken during each session for					
Baseline	☐	☐	☐	☐	☐
Post Video Making	☐	☐	☐	☐	☐
Intervention 1	☐	☐	☐	☐	☐
Intervention 2	☐	☐	☐	☐	☐
All participants	☐	☐	☐	☐	☐

Oral Comprehension	**True**	**False**
No intentional prompting or reinforcement was used during the question asking component of the following phases; Baseline, Post Video Making or Intervention 1	☐	☐
Reinforcement or prompting was only used during Intervention 2, or during video viewing for the participants	☐	☐
The videos shown to the participants were of similar content	☐	☐
No rehearsal of video contents took place between the researcher and the participant during video watching	☐	☐

Emotional recognition	**1**	**2**	**3**	**4**	**5**
The same steps/processes were undertaken during each session for					
Baseline	☐	☐	☐	☐	☐
Post Video Making	☐	☐	☐	☐	☐
Intervention 1	☐	☐	☐	☐	☐
Intervention 2	☐	☐	☐	☐	☐
Both participants	☐	☐	☐	☐	☐

Emotional Recognition	True	False
No intentional prompting or reinforcement was used during the question asking component of the following phases; Baseline, Post Video Making or Intervention 1	☐	☐
Reinforcement or prompting was only used during Intervention 2, or during video viewing	☐	☐
The videos shown to the participants were of similar content	☐	☐
No rehearsal of video contents took place between the researcher and the participant during video watching	☐	☐

Part B

(Complete for all participants)

Ratings

On a scale of 1-5 (1=Never, 2=Hardly ever, 3=Sometimes, 4 most of the time, 5=All the Time)

Intervention 1	1	2	3	4	5
Enjoyed watching the peer video	☐	☐	☐	☐	☐
Enjoyed watching the self video	☐	☐	☐	☐	☐
Paid attention to the video	☐	☐	☐	☐	☐
Showed signs of distress during video viewing (not boredom)	☐	☐	☐	☐	☐

	Yes	No
Did the participant enjoy watching one video over another?	☐	☐

	Peer	Self
If yes, which did they enjoy most?	☐	☐

Part C(1)
(Complete for participants 1,3,5,6)

Ratings
On a scale of 1-5 (1=Never, 5=All the Time)

Intervention 2	1	2	3	4	5
Enjoyed watching the peer video	☐	☐	☐	☐	☐
Enjoyed watching the self video	☐	☐	☐	☐	☐
The participant paid attention to the video	☐	☐	☐	☐	☐
The participant showed signs of distress (not boredom)	☐	☐	☐	☐	☐
Reinforcement was given in a consistent manner	☐	☐	☐	☐	☐

	Yes	No
If there was a video preference, did it remain the same as the preference in Intervention 1	☐	☐
	Peer	**Self**
If no, which did they enjoy most?	☐	☐

Part C(2)
(Complete for P3)

Ratings
On a scale of 1-5 (1=Never, 5=All the Time)

Intervention 2	1	2	3	4	5
Enjoyed watching the peer video	☐	☐	☐	☐	☐
Paid attention to the video	☐	☐	☐	☐	☐
The participant showed signs of distress (not boredom)	☐	☐	☐	☐	☐

	True	False
Reinforcement was never used during this phase	☐	☐

Part D

If you were to rank the participants in order of who preferred the video vignettes the most, how would you rank them?	1	2	3	4	5	6
Participant 1	☐	☐	☐	☐	☐	☐
Participant 2	☐	☐	☐	☐	☐	☐
Participant 3	☐	☐	☐	☐	☐	☐
Participant 4	☐	☐	☐	☐	☐	☐
Participant 5	☐	☐	☐	☐	☐	☐
Participant 6	☐	☐	☐	☐	☐	☐

Comments

Appendix N

Detailed Trend Analyses

Interpretation of the graphed data is considered an important methodological consideration. According to Cooper et al. (1987) and Poling et al. (1995), interpretation of graphed data should include statements about means, trends, variability and latency of change. Poling et al. (1995) consider the mean to be very useful in interpreting graphed data particularly with data that is highly inconsistent between and within phases. Depending on the treatment direction wanted, Cooper et al. (1987) suggest an ascending or descending baseline may be appropriate for intervention to commence. The focus of this thesis was on acquisition behaviour, for this reason a descending baseline or a zero trend was deemed appropriate for progressing phases. Poling et al. (1995) also suggest the spread of the data along the vertical axis and the overlap of the data across phases must be taken into consideration when evaluating variability. According to Poling et al (1995) overlapping variability is the "range of values of the target behaviour that are observed across all the phases" (p.157). Tawney and Gast (1984) suggest examining the amount of variability and the range in data points collected; if the range of values is low; then stability is indicated. When considering latency of change, Poling et al. (2005) suggests examining the time between a change in conditions and a change in behaviour. The longer the time between the condition and the behaviour change, the less clear the intervention effect. Consideration was given to these factors in the interpretation of the data, and readers are directed to Tawney and Gast (1984) for the specific formula used for the graphic analysis of the data in this section.

The following tables provide summaries of the data across both VM conditions and interventions, for each participant (with the exception of P1 who scored zero across the phases and P5 as further analyses was not warranted due to 0% correct responding). The tables contain the length (number of sessions) in each condition, the mean and median percentage correct, the trend and trend direction in each phase (if a trend was noted) and the data paths within the trend. Level stability, the range, level changes (the difference between the highest data points across phases), the latency to change and whether the criterion was reached are also contained in the tables.

Summary of data for P2 across all the peer and self video phases.

Summary Data for the Peer Condition				
Conditions	Baseline	Post Video Production (extended baseline)	Intervention 1	Intervention 2
Condition Length (No. of sessions)	5	7	4	15
Mean% correct	0%	0%	0%	25%
Median % correct	0%	0%	0%	12.5%
Trend	No Trend	No Trend	No Trend	Variable
Trend Direction	$\bar{(0)}$	$\bar{(0)}$	$\bar{(0)}$	/ (+)
Data Paths within Trend	$\bar{(=)}$	$\bar{(=)}$	$\bar{(=)}$	/ (+)
Level Stability and Range	No Variability (0-0)	No Variability (0-0)	No Variability (0-0)	Variable (0%-50%)
Level Change	0	0	0	50%
Latency of Change	-	0	0	3
Criterion Reached	No	No	No	No

Summary Data for the Self Condition				
Conditions	Baseline	Post Video Production (extended baseline)	Intervention 1	Intervention 2
Condition Length (No. of sessions)	5	7	4	15
Mean% correct	0%	0%	0%	30.8%
Median % correct	0%	0%	0%	50%
Trend	No Trend	No Trend	No Trend	Variable
Trend Direction	$\bar{(0)}$	$\bar{(0)}$	$\bar{(0)}$	/ (+)
Data Paths within Trend	$\bar{(=)}$	$\bar{(=)}$	$\bar{(=)}$	/ (+)
Level Stability and Range	No Variability (0-0)	No Variability (0-0)	No Variability (0-0)	Variable (0-50%)
Level Change	0	0	0	50%
Latency of Change	-	0	0	3
Criterion Reached	No	No	No	No

Summary of data for P3 across all phases for the peer and self video conditions.

Summary Data for the Peer Condition				
Conditions	Baseline	Post Video Production (extended baseline)	Intervention 1	Intervention 2
Condition Length (No. of sessions)	5	11	10	17
Mean% correct	0%	5.68%	11.25%	55.15%
Median % correct	0%	12.5%	12.5%	62.5%
Trend	No Trend	Variable	Variable	Variable
Trend Direction	_ (=)	/ (+)	\ (-)	/ (+)
Data Paths within Trend	_ (=)	_ (=)	/ \ (+) (-)	/ \ (+) (-)
Level Stability and Range	Stable (0-0)	Variable (0-12.5%)	Variable (0-25%)	Variable (0-87.5%)
Level Change	0	12.5%	25%	87.5%
Latency of Change	-	2	3	3
Criterion Reached	No	No	No	No

Summary Data for the Self Condition				
Conditions	Baseline	Post Video Production (extended baseline)	Intervention 1	Intervention 2
Condition Length (No. of sessions)	5	11	11	-
Mean% correct	7.5%	17.04%	69.4%	-
Median % correct	0%	25%	75%	-
Trend	Variable	Variable	Variable	-
Trend Direction	/ (+)	/ (+)	/ (+)	-
Data Paths within Trend	\ / (-) (+)	/ \ (+) (-)	/ (+)	-
Level Stability and Range	Variable (0-12.5%)	Variable (0-37.5%)	Variable (37.5%-100%)	-
Level Change	12.5	37.5	62.5%	-
Latency of Change	-	4	2	-
Criterion Reached	No	No	Yes	-

Summary of data for P4 across all phases for the peer and self video conditions.

Summary Data for the Peer Condition				
Conditions	Baseline	Post Video Production (extended baseline)	Intervention 1	Intervention 2
Condition Length (No. of sessions)	5	13	7	5
Mean% correct	47.5%	59.61%	69.64%	80%
Median % correct	50%	60%	75%	75%
Trend	Variable	Stable	Variable	Variable
Trend Direction	/ (+)	/ (+)	/ (+)	/ (+)
Data Paths within Trend	/ (+)	_ / (=) (+)	/ (+)	/ (+)
Level Stability and Range	Variable (12.5%-62.5%)	Stable (37.5%-62.5%)	Stable (62.5%-70%)	Variable (62.5%-87.5%)
Level Change	50	25	12.5	25%
Latency of Change	-	0	3	2
Criterion Reached	No	No	No	Yes

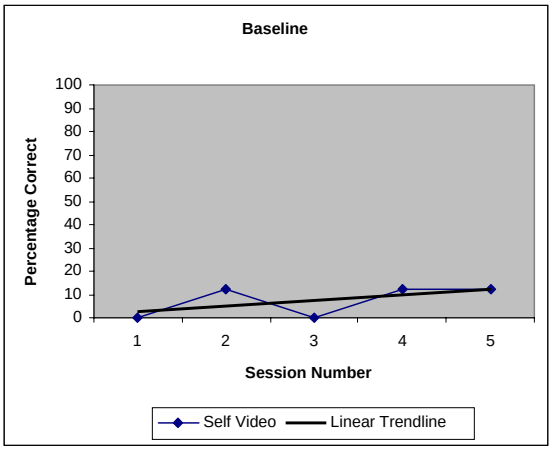
Summary Data for the Self Condition				
Conditions	Baseline	Post Video Production (extended baseline)	Intervention 1	Intervention 2
Condition Length (No. of sessions)	5	13	7	5
Mean% correct	15%	31.73%	50%	85%
Median % correct	12.5%	37.5%	37.5%	100%
Trend	Variable	Variable	Variable	Variable
Trend Direction	_ (=)	/ (+)	/ (+)	/ (+)
Data Paths within Trend	_ (=)	_ / (=) (+)	/ (+)	/ _ (+) (=)
Level Stability and Range	Variable (0%-25%)	Variable (37.5%-62.5%)	Variable (37.5%-50%)	Variable (62.5%-100%)
Level Change	25	25	12.5	37.5%
Latency of Change	-	1	0	1
Criterion Reached	No	No	No	Yes

Summary of data for P6 across all phases for the peer and self video conditions.

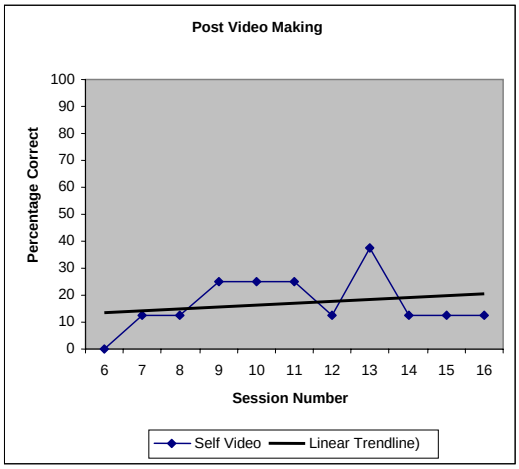
Summary Data for the Peer Condition				
Conditions	Baseline	Post Video Production (extended baseline)	Intervention 1	Intervention 2
Condition Length (No. of sessions)	5	8	4	5
Mean% correct	13.2%	0%	0	19.8%
Median % correct	22%	0%		11
Trend	Variable	No Trend	No Trend	Variable
Trend Direction	\ (-)	_ (=)	_ (=)	- (=)
Data Paths within Trend	_ \ (=) (-)	_ (=)	_ (=)	\ / (-) (+)
Level Stability and Range	Variable (0-22%)	Stable (0)	Stable (0)	Variable (11%-33%)
Level Change	22	0	0	22
Latency of Change	-	0	0	1
Criterion Reached	No	No	No	No

Summary Data for the Self Condition				
Conditions	Baseline	Post Video Production (extended baseline)	Intervention 1	Intervention 2
Condition Length (No. of sessions)	5	8	5	6
Mean% correct	8.8%	1.375%	2.2%	22%
Median % correct	11%	5.5%	11%	22%
Trend	Variable	Stable	Stable	Variable
Trend Direction	_ (=)	_ (=)	_ (=)	/ (+)
Data Paths within Trend	_ (=)	/ \ (+) (-)	/ \ (+) (-)	- - (=) (=)
Level Stability and Range	Variable (0-22%)	Variable (0-11%)	Variable (0-11%)	Variable (11%-44%)
Level Change	22	11	11	33
Latency of Change	-	5	3	2
Criterion Reached	No	No	No	No

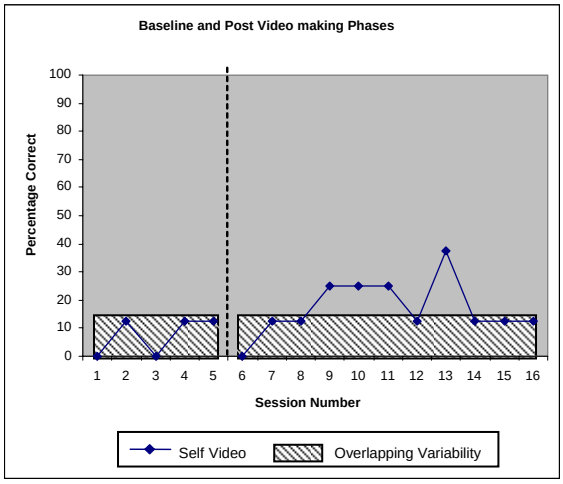
The following figures illustrate the trends, means, and overlapping variability highlighted in the results sections of Study 1 (for P3, P4, and P6). Data for the other participants are not included due to 0% correct responding or because there was no need for further analyses. Explanations follow each set of figures to supplement the results presented in Study 1. Regression lines fitted to the data in these figures indicate the trend direction of the data and were fitted using Microsoft Office Excel 2003. The sessions in each figure follow the sessions for each condition rather then the session they were actually tested in (i.e., generalisation data is removed and the sessions for the VM condition not presented in the tables are not included in the count. That is; it is the sessions for that VM condition only).



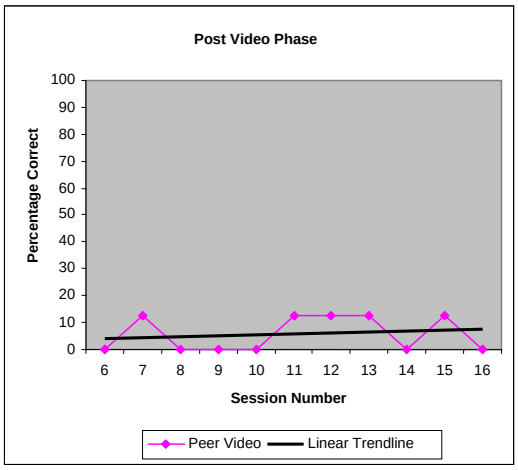
Trendline for P3; self video condition, baseline.



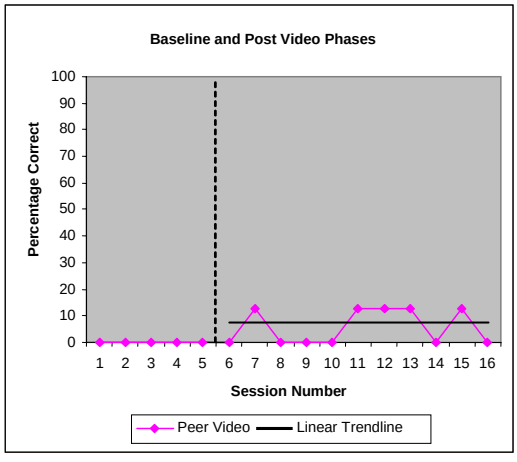
Trendline for P3 self video condition, post video making.



Overlapping variability across baseline and post video making phases, P3; self video condition.

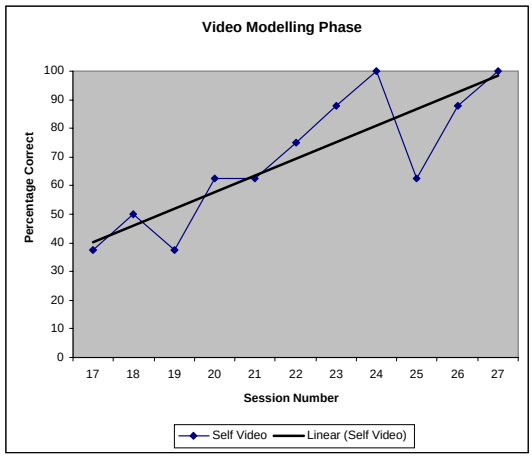


Trendline for post video making phase, P3; peer video condition.

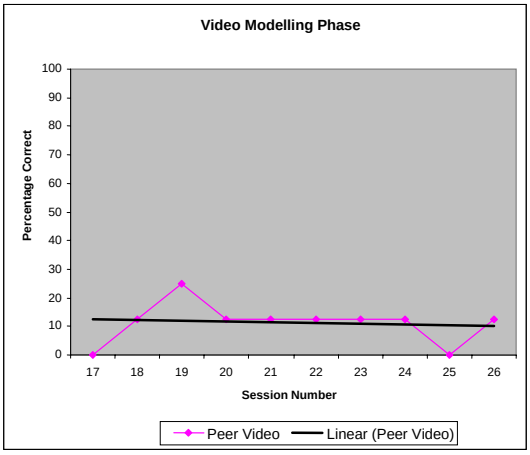


Changes in mean across baseline and post video making phases, P3; peer video condition.

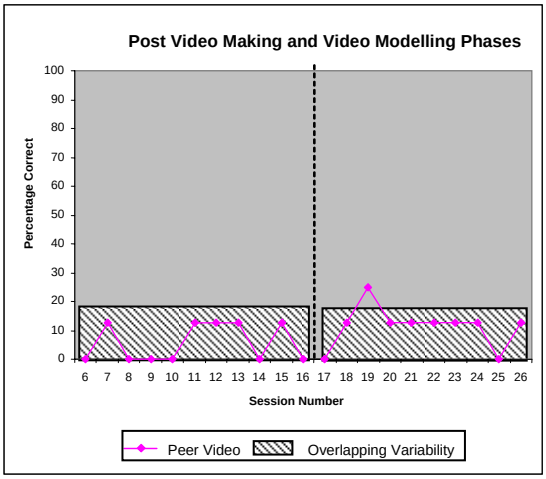
During baseline for the VSM condition, P3's % correct showed some variability, and an overall increasing trend with a small degree of the slope. P3's % correct during the post-video making phase was similar to that in baseline, it was variable, and there was an overall increasing trend with a small degree of slope. Analysis across the two phases indicates post-video making may have had a small effect on responding although this is unclear due to the amount of overlapping variability between the phases. During the VPM condition P3 responded at 0% across the baseline phase. During the post video phase P3's responding was variable, and showed an overall increasing trend with a very small degree of slope. An increase in mean can be noted across the two phases in the earlier table and suggests that video making may have played a role in increasing responding. However, at least half of the data points in the post video making phase overlap with those in baseline, this overlapping variability makes it difficult to determine how much of an effect video making had.



Percentage correct for P3 during the video self modelling phase.

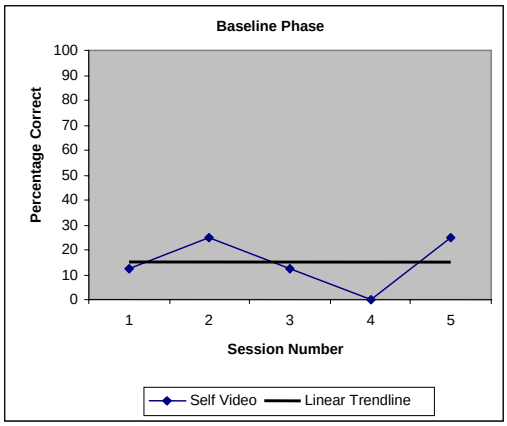


Percentage of correct responding for P3 during the peer video modelling phase.

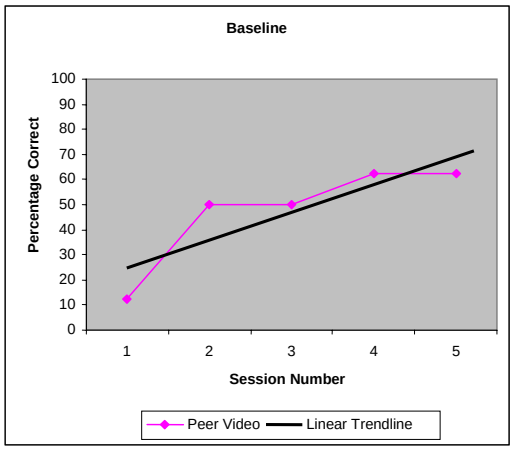


Overlapping variability for P3 for the self video condition across the post video making and intervention phases.

During the intervention phase for the self video condition P3's % correct showed an increasing trend with a large degree of slope, the criterion was reached after 11 sessions. During the intervention phase for the peer condition, P3's correct responding increased for only one session, and although the mean increased from 5.68% in the post video making phase to 11.25% in the intervention phase (see table above), the degree of overlapping variability was extremely high. What is more the trendline fitted in a figure above indicates a slight decrease in responding with a very small degree of slope. These measures and the graphs indicate that the VPM intervention had no significant effect on correct responding.

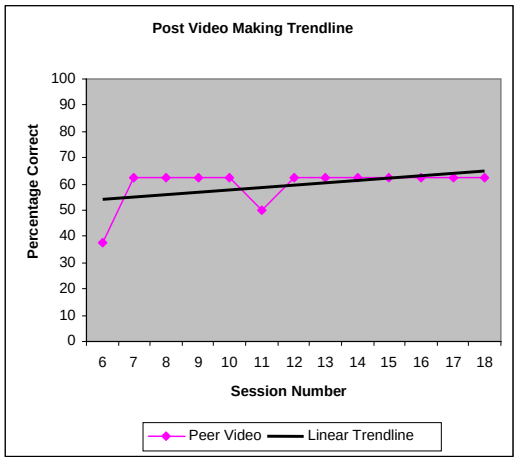


Baseline trend for self video condition, P4.

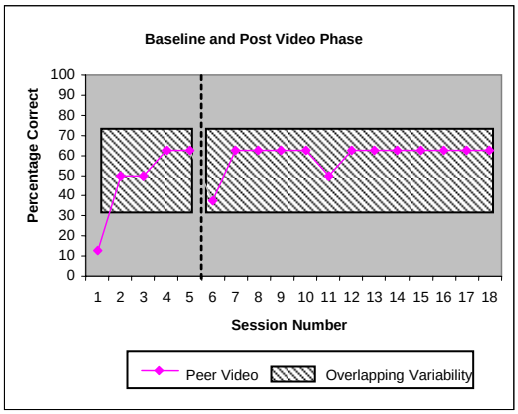


Baseline trend for the peer video condition, P4.

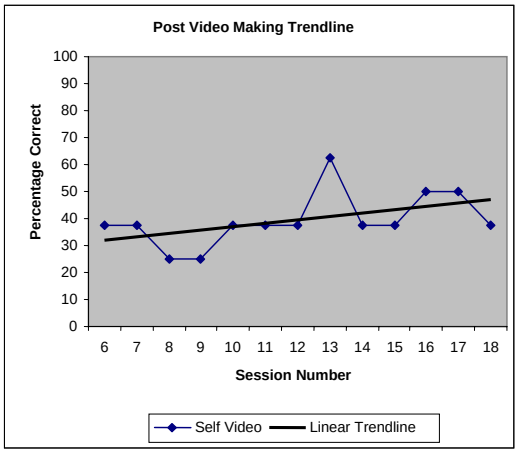
During baseline P4's responding showed an increasing trend for the peer condition with a large degree of slope (indicating an ascending baseline). Baseline responding for self condition indicated some variability in the data but no trend was evident in the data.



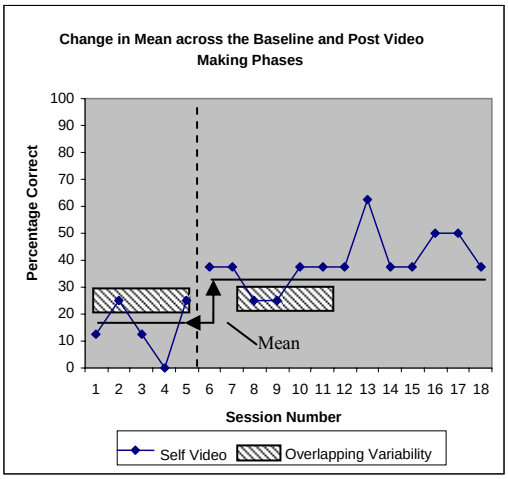
Post video making trend for the peer video condition, P4.



Overlapping variability across baseline and post video making phases, P4; self video condition.

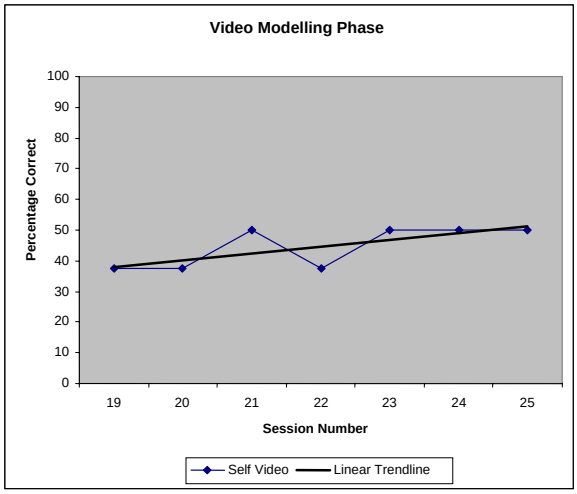


Post video making trend, self modelling condition, P4.

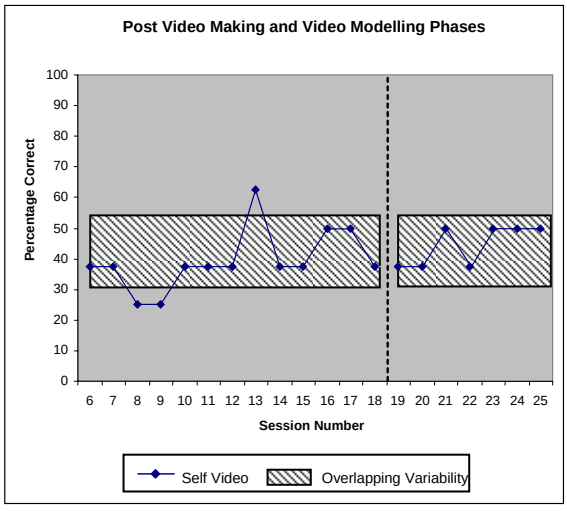


Change in mean for P4 across baseline and post video making phases; self video condition.

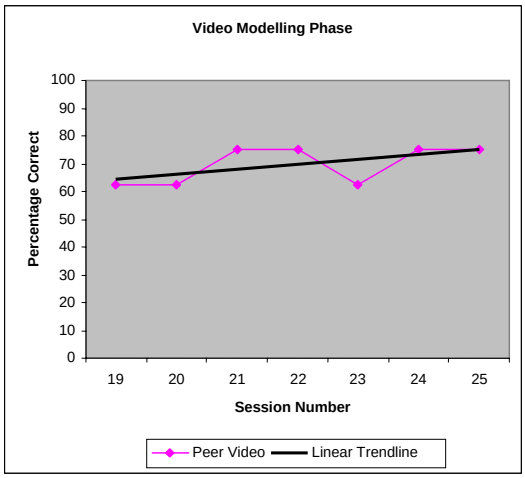
Following baseline, responding for P4 for the peer condition decreased for the first session and then increased to previous levels of responding for all but one of the remaining sessions. For the peer condition there was an ascending trend with a small to moderate degree of slope for the post video making phase. Due to the amount of overlap in correct responding between these two phases it can confidently be said that video making did not have an effect on responding for the peer condition. For the self condition there was an increasing trend with a moderate degree of slope. Analysis across the two phases indicates that video modelling had an effect on responding. Specifically; the initial data point collected during post video making was higher then any collected during baseline, and the mean percentage correct was higher during the post video making phase.



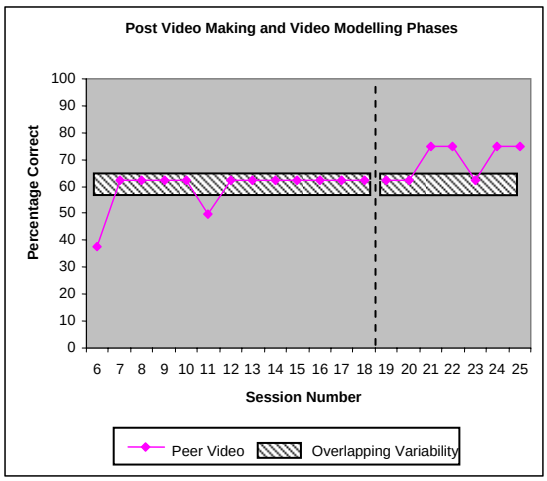
Intervention 1, video self modelling phase, P4.



Overlapping variability for the post video modelling and video self modelling phases, P4.

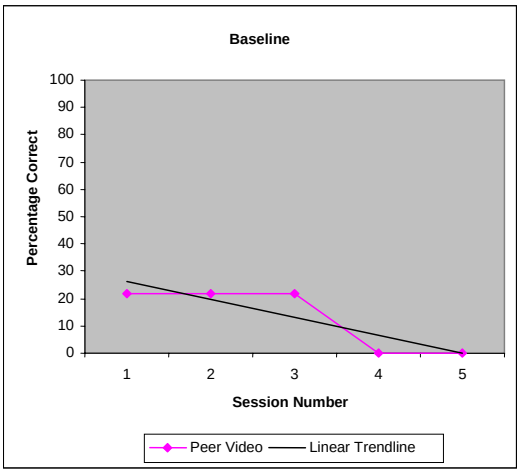


Intervention 1, trendline for the video peer modelling phase, P4.

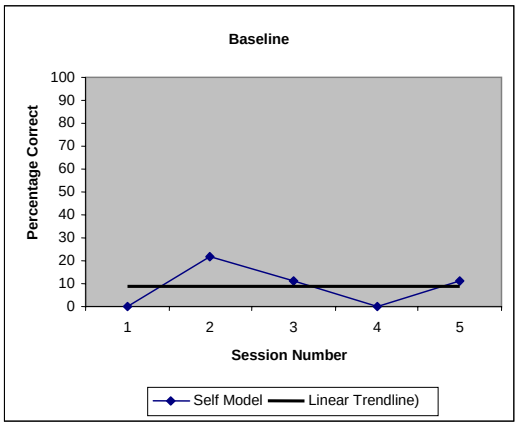


Overlapping variability, for the post video making and video peer modelling phases, P4.

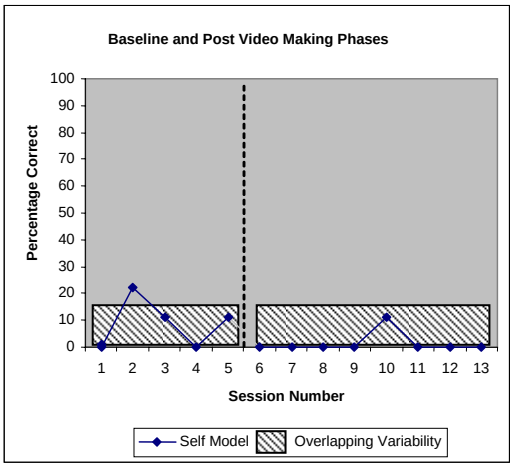
For P4 the % correct was variable and showed a slight increasing trend with a small degree of slope in the VSM intervention phase. Overlapping variability between the two phases indicates that the intervention did not increase responding for this condition. For the peer condition a small to moderate degree of slope and some variability can be noted along with a change in mean. The table supplied indicates the percentage correct changed from 59.61% during post video making to 69.64% during intervention. This indicates video intervention did in fact have some effect on responding for P4. However, how much of an intervention effect is unclear due to the overlapping variability between the post video making and intervention phases.



Trendline for P6 during the baseline phase for the video peer modelling condition.



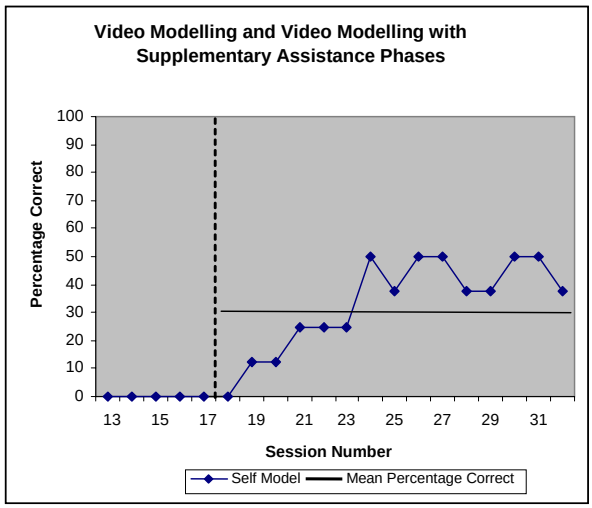
Trendline for P6 during the baseline phase for the VSM condition.



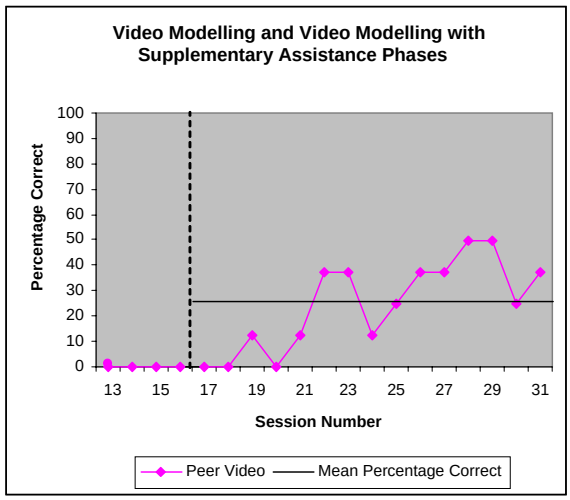
Overlapping variability across baseline and post video making phases, P6; VSM condition.

P6's responding during baseline for the VPM condition, showed a decreasing trend, from 22% to 0% over five sessions. During the following two phases responding remained at 0%, indicating no changes in responding following video making or intervention. VPM was ineffective for this target behaviour with P6. During the baseline phase for the self condition P6's % correct showed variability no consistent trend. During the post video making phase, P6 showed close to 0% correct. The figure demonstrates the overlapping variability between the two phases and that video making had no effect on responding. During the VSM intervention phase, responding remained at levels close to zero with P6 scoring only one correct answer. The VSM intervention was ineffective for this target behaviour for P6.

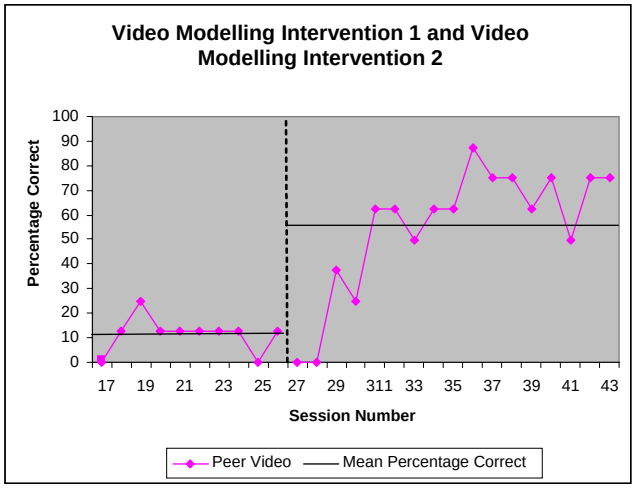
The following figures illustrate the change in mean across Intervention 1 and Intervention 2 (for P2, P3, P4 and P6) and supplements the results presented in Study 2 and in the tables. P5's data is not included due to 0% correct responding during Intervention 2 and a decrease in mean. All the figures below show an increase in mean percentage correct and indicate Intervention 2 had some effect on correct responding for these participants. The figure indicates that only P4's correct responding reached the criterion.



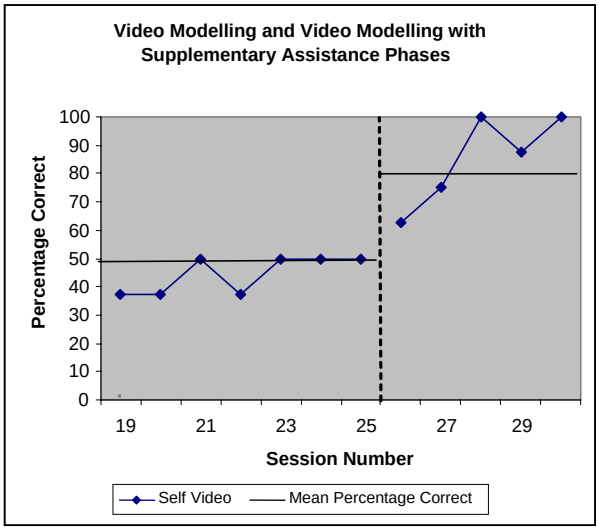
Change in mean percentage correct for the self condition across Intervention 1 and Intervention 2 for P2.



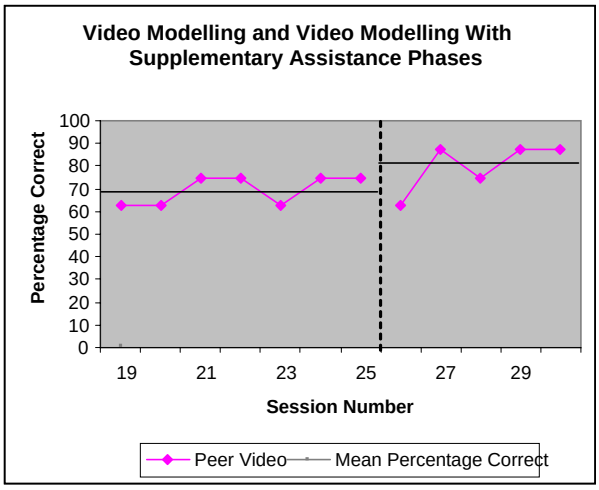
Change in mean percentage correct for the peer condition across Intervention 1 and Intervention 2 for P2.



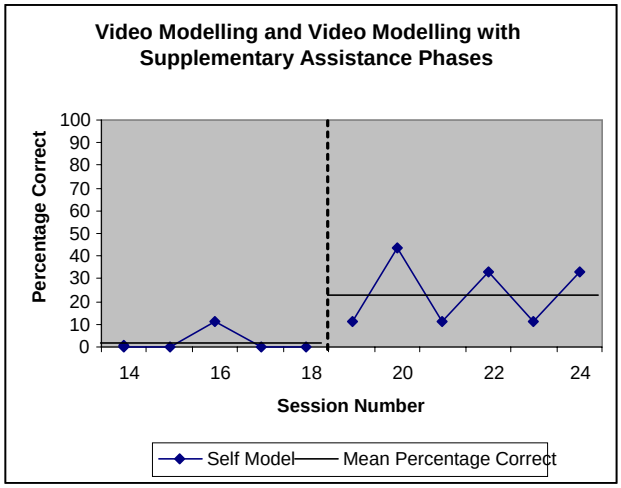
Change in mean percentage correct for the peer condition across Intervention 1 and Intervention 2 for P3.



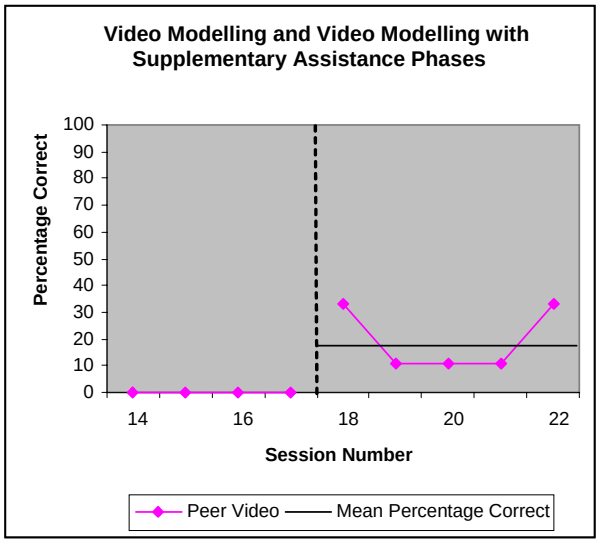
Change in mean percentage correct for the self condition across Intervention 1 and Intervention 2 for P4.



Change in mean percentage correct for the peer condition across Intervention 1 and Intervention 2 for P4.



Change in mean percentage correct for the self condition across Intervention 1 and Intervention 2 for P6.



Change in mean percentage correct for the peer condition across Intervention 1 and Intervention 2 for P6.

Appendix O

The discrete trial training procedures and criteria used for Intervention 2.

Discrete Trial Training Intervention 2. ORAL COMPREHENSION	Given the question set (what, where or why, when) the participant gives a correct unprompted verbal response from the pre-determined response schedule on 7/8 opportunities across two consecutive sessions.
Teaching Procedure for Intervention*:* 3-5 second constant delayed prompt with most to least fading of verbal prompts (3-5-s const del pr (M-L) verb pr). Verbal Prompts Immediate full model of response or additional verbal instruction (are given in accordance with the levels below) and fades prompt across steps with a constant delay inserted. Step 0 – immediate full VM =IFV Step 1 – 5 sec delay w/full VM= DFV Step 2 – 5 sec delay w/partial verbal model =PV Step 3 – no prompt=NP e.g., saying, "Saturday morning" then saying, "satur.." Teacher Behaviour Sit in chair across from participant In response to *"What, when, why or where"* question Level 1: State question wait 3-5 sec's. NR= move to next level. IC= remove eye contact, move to next level. C= give praise and tangible reinforcement (sticker) move to next question. Level 2: State the same question wait five sec's follow the same processes used in level 1. Except IC=no eye contact and corrective feedback 'No', remove reinforcers. NR corrective feedback "No"	*Suggested Prerequisites:* Sitting in chair, eye contact, verbal imitation *Criteria to increase steps:* at least 7 (C, CP) correct for one session. *Criteria to decrease steps:* 3 consecutive errors at a prescribed step=go back a step or 4 total errors within a session, go back a step in the next session for that condition/ question set. *Criteria for help or program revision:* 4 errors at step 0. No unprompted responses at highest step or no progression to next step after 3 blocks. *Correction Procedure:* If student makes error or does not respond remove eye contact for 2 seconds (L1), give a short verbal no, remove reinforcers and eye contact (Level 2 & 3a), represent trial (level 2), continual prompt (Level 3b). *Reinforcement:* Reinforce C and CP. That is; the participant receives 1 sticker (token). For every 2 stickers collected they have 2.5 minutes computer time or sports game at the end of session.

Move to next Level. C=praise and reinforcement Level 3a: State same question give prompt (Prompt will depend on the step). CP= Praise & reinforcement. ICP= Corrective Feedback "No", remove eye contact and reinforcers move to next question. Level 3b. If participant gives a 'near' correct answer in level three (with the omission of a few words, i.e. 'the' from 'at new train station') after providing feedback, prompt until participant is saying the complete answer. Give only verbal praise. Move to next step after criteria is met. 7/8 (C, CP) correct for one session Child Behaviour Sits in chair facing teacher and follows instructions	*Response definition(s):* Correct verbal response from predetermined response schedule *Data recording:* C = correct before prompt CP = correct with prompt IC = incorrect without prompt ICP = incorrect with prompt NR = no response

Appendix P

Oral comprehension data collection form this was used across Intervention 2.

Person filling out form… …… Name of participant……

Date: /0 /07 Session: Peer or Self	Level	C = correct before prompt, CP = correct with prompt, IC = incorrect without prompt, ICP = incorrect with prompt, NR = no response).							
		Step/prompt type (IFV, DFV, PV, NP	Question 1 (Circle) WHEN WHERE	RFT (Y=Yes N=No)	Actual response	Step/prompt type (IFV, DFV, PV, NP	Question 2 (Circle) WHY WHAT	RFT (Y=Yes N=No)	Actual response
Story No.	1								
	2								
	3								
Story No.	1								
	2								
	3								
Story No.	1								
	2								
	3								
Story No.	1								
	2								
	3								

%Correct: Q1L1= L2= L3= Q2L1= L2= L3=

No Prompt= Feedback= Verbal Prompt=

No Prompt= (Q1L1 + Q2L1) /2
Feedback= (Q1L2 + Q2L2) /2
Verbal Prompt (Q1L3 + Q2L3) /2

Appendix Q

The discrete trial training procedures and criteria used for Intervention 2 for the emotional recognition condition.

<table>
<tr><td>EMOTIONAL RECOGNITION</td><td>Given the instruction “touch the picture with the …face” the participant unprompted, touches the correct picture on 8/9 opportunities across two consecutive sessions.</td></tr>
<tr><td rowspan="3">Teaching Procedure for Intervention:
Most to Least fading of physical prompts
(M-L p guide)
Manual Guidance Prompts
Begins with full physical guidance and fades guidance at each step (no delay)
Step 0 –Immediate full guidance (Hand over Hand and elbow)=IFG
Step 1 – Light Physical Guidance (lightly touches elbow and directs)= LG
Step 2 – Light touch on hand then shadow (SG)
Step 3 – no prompt=NP
Teacher Behaviour
Sit in chair across from child, hold the cork board up with the three pictures

In response to "touch the picture with the…..face”

Level 1: Give instruction, wait 3-5 seconds. NR= move to next level. IC= remove eye contact, move to next level. C= give verbal praise and reinforcement (15sec of music from laptop, hand clap, or bubbles) move to next question.

Level 2: Give the same instruction wait 3-5 sec’s follow the same processes used in level 1. Except for IC & NR, an additional ‘No’ (corrective feedback) is given.

Level 3: Give same instruction and give immediate prompt (depending on the step). Consequences and</td><td>Suggested Prerequisites: Sitting in chair, eye contact.</td></tr>
<tr><td>Criteria to increase steps: at least 8 (C, CP) correct for one session.

Criteria to decrease steps: 3 consecutive errors at a prescribed step=go back a step or 4 total errors within a session, go back a step in the next session for that condition/ emotion set.

Criteria for help or program revision: 3 errors at step 0. No unprompted responses at highest step or no progression to next step after 3 blocks.

Correction Procedure: If student makes error or does not respond remove eye contact (Level 1). Give a short verbal no remove eye contact for 2 seconds, flip board (Level 2) and represent trial, move to next emotion or picture set (Level 3).

Reinforcement: Reinforce C and CP. That is; 15-30secs of music, handclap, or bubbles.</td></tr>
<tr><td>Response Definition(s): Participant touches the picture equivalent to the given instruction</td></tr>
</table>

recording same as above. Except CP= reinforcement, and praise. ICP move to next question. Move to next step after child's behaviour meets criteria. 8/9 (C, CP) correct for one session Childs Behaviour Sits in chair, faces teacher & follows instructions	*Data Recording:* C = correct before prompt CP = correct with prompt IC = incorrect without prompt ICP = incorrect with prompt NR = no response

Session Number

Appendix R

Emotional recognition data collection form this was used during Intervention 2.

Person filling out form… ……Name of participant……

Date: /0 /07 Session: Peer or Self	Level	C = correct before prompt, CP = correct with prompt, IC = incorrect without prompt, ICP = incorrect with prompt, NR = no response).									
		Step/prompt type (IFG, LG, SG, NP	Emotion (Circle) Happy Sad	RFT (Y=Yes N=No)	Step/prompt type (IFG, LG, SG, NP	Emotion (Circle) Scared Surprised	RFT (Y=Yes N=No)	Step/prompt type (IFG, LG, SG, NP	Emotion (Circle) Disgusted Angry	RFT Y= Yes, N=No	Comments
Set No.	1										
	2										
	3										
Set No.	1										
	2										
	3										
Set No.	1										
	2										
	3										

%Correct: EM1L1= L2= L3= EM2L1= L2=
L3= EM3L1 L2= L3=
No Prompt= Feedback Physical Prompt=

Key
No Prompt= (EM1L1 + EM2L1 + EM3L1) /3
Feedback= (EM1L2 + EM2L2 + EML3) /3
Physical Prompt= (EM1L3 + EM2L3 + EM3L3) /3