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COMPARING WRONG/RIGHT WITH RIGHT/RIGHT EXEMPLARS IN VIDEO MODELLING TO TEACH SOCIAL SKILLS TO CHILDREN WITH AUTISM

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ANNA MARGARETHA DEKKER

University of Waikato

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ABSTRACT

Research has shown that video modelling can improve social behaviours in children with ASD. In addition, research in behaviour modelling training from the field of organisational psychology has shown that using a mix of positive and negative exemplars can assist in acquisition and generalisation of a skill. The current study compared the use of one negative and one positive exemplar, with the use of two positive exemplars to determine which combination would result in faster acquisition and/or superior generalisation of a skill. No other studies have examined this with children diagnosed with ASD. Seven children, aged between 5 and 15 years, and diagnosed with ASD participated in a multiple baseline design across children; within child across two modelling conditions; and within each modelling condition across two tasks. In one condition, a participant watched a video containing one exemplar of a model (same sex and of similar age but with normal development) perform a task the wrong way, and one exemplar of the same model perform the same task the right way (wrong/right). In another condition, the participant watched a video containing two different exemplars of the model perform a matched task the right way (right/right). During the intervention, 1 participant refused to watch the videos. For 13 of the 16 tasks, where training was completed, participants either reached criterion or made some gains in acquisition of the social skills. However, for seven of the tasks criterion was not reached. Generally, neither modelling condition was superior in acquisition or generalisation of the targeted social skills. Confounds occurring during the course of the study may have contributed to the equivocal results. For some children with ASD, video modelling in combination with the delivery of preferred reinforcers may be required for successful skill acquisition. Further implications, particularly the potential negative effects of vicarious reinforcement when an observer does not gain reinforcement for imitation are discussed, as are recommendations for future research.

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The essential features of Autistic Disorder and Asperger's Disorder are impairments in social interaction (e.g., failure to make eye-contact, lack of peer relationships, lack of social reciprocity), and repetitive stereotyped behaviour (e.g., preoccupation with one interest which is abnormal in intensity or focus) (American Psychiatric Association, 2000). Additionally, for a diagnosis of Autistic Disorder, impairments in social communication (e.g., delays in development of social language, failure to initiate or maintain conversation) are present (American Psychiatric Association, 2000). Autism Spectrum Disorder (ASD) refers to a group of developmental disorders which include autism and Asperger's syndrome (Ministries of Health and Education, 2008). Diagnosticians may make a general diagnosis of ASD when there is insufficient information to make a specific diagnosis of Autistic Disorder, Asperger's Disorder, or other developmental disorder.

The impairments outlined above present challenges for individuals diagnosed with ASD. Ayres and Langone (2005) state that children with autism experience considerable difficulty in social interactions, which may result in peers excluding them at school (Apple, Billingsley, & Schwartz, 2005). In light of this, there appears to be a need for social skills training to help with social difficulties. In fact, Scattone (2007) suggests that children with ASD often require to be taught social interaction and conversational skills. Thus, it goes without saying, that any intervention that could teach social and communication skills successfully would improve the lives of children with ASD.

People seldom learn behaviours that they have not first observed others perform (Bandura, 1977). Both Bandura (1977) and Lovaas (2003) state that complex behaviours such as language and social skills can only occur with the assistance of modelling.

Observational learning is generally used interchangeably with terms such as modelling, imitation, vicarious learning, and vicarious reinforcement (Krasner, 1990) and will be used interchangeably here. Two main theories have emerged with regard to observational learning (Nikopoulos & Keenan, 2006). Firstly, Bandura's social learning theory (a cognitive theory) and secondly, reinforcement (operant) theory (Nikopoulos & Keenan, 2006). Bandura (1977) claims that nearly all learning that

results from direct experience, occurs vicariously, by observing the behaviour of others and the consequences for such behaviour. In social learning theory, vicarious reinforcement occurs when an observer increases a behaviour he has seen another perform and receive reinforcement for (Bandura, 1977). Conversely, if an observer decreases a behaviour he has seen another perform and receive punishment for, then vicarious punishment has occurred (Bandura, 1977). Bandura claimed that reinforced behaviour may draw an observer's attention to the behaviour, allowing the observer to learn from it, but the observer's imitation did not necessarily require reinforcement for learning to result (Bandura, 1977). That is, an observer may imitate behaviour without extrinsic reinforcement (Bandura, 1977). Thus, Bandura did not believe that behavioural learning principles could account for all instances of observational learning, and hence included cognitive variables (i.e., representational expectations) to explain the phenomenon (Masia & Chase, 1997). In a behavioural framework (i.e. operant conditioning) the delivery of reinforcement (or punishment) is considered crucial to learning.

Behaviourists believe that observational learning can be explained by behavioural principles (Masia & Chase, 1997). Masia and Chase suggest that processes such as intermittent reinforcement, stimulus discrimination, conditional discrimination, stimulus generalisation, and functional classes may explain instances of imitation. For example, firstly, it is likely that intermittent reinforcement maintains imitation of modelled behaviour. Thus, imitation is not required to be directly reinforced whenever it occurs as behaviour maintained by intermittent reinforcement is resistant to extinction (Masia & Chase, 1997).

Secondly, modelling can be an antecedent strategy, when it is used as a prompt or a discriminative stimulus. Modelling is a prompt, when a model demonstrates the correct behaviour while the student imitates it (Lovaas, 2003). Modelling is a discriminative stimulus, when an observer imitates another's behaviour and is consequently reinforced for that imitation (Martin & Pear, 2003). For example, a child telling a joke which results in his peers laughing (a reinforcer), may set the occasion for an observer to tell a joke (e.g., if the observer wishes to make his peers laugh, or desires attention). Another example, given by Martin and

Pear, occurs when an observer sees a person open a door to go outside. The observer gains the same reinforcement when he opens the door (i.e., going outside).

Thirdly, a conditioned discriminative stimulus can produce imitation (Masia & Chase, 1997). For instance, an instruction is a conditioned discriminative stimulus, when an observer is instructed that imitation of a model's behaviour will produce delivery of reinforcement (Masia & Chase, 1997). So, an observer may increase imitation of the observed behaviour depending on the observer's history of instruction following, and the observed consequence (Masia & Chase, 1997).

Fourthly, imitation can be an operant class of responses (Martin & Pear, 2003). That is, if an observer gains reinforcement for imitating a model, the observer is more likely to imitate other modelled behaviour in the future. That is, imitation can become generalised to the extent that other modelled behaviour is imitated (Martin & Pear, 2003). Thus, a person's history of imitation and the consequences delivered for that imitation (reinforcement or punishment) influences his/her future imitative behaviour (Martin & Pear, 2003). Accordingly, in a behavioural framework, observational learning (imitation) can be explained.

Despite the differing explanations as to the processes involved in observational learning, neither cognitivists nor behaviourists dispute the ability of observers to learn from modelled behaviour (e.g., Bandura, 1977; Masia & Chase, 1997). Although, it has been suggested that attentional deficits and difficulties in responding to multiple cues affect some children with ASD, and for these children observational learning is impaired (Lovaas, Koegel, & Schreibman, 1979).

Modelling can be used systematically (by teachers, psychologists, behaviour specialists) to teach skills. When modelling is used in this way, a behaviour sample is presented to a person with the intention that the person will imitate the behaviour demonstrated (Martin & Pear, 2003). Generally, guidelines for the use of modelling include using peers as models, using rules with modelling, arranging for the model to receive natural reinforcers for actions, and arranging training so that the observer receives natural reinforcers for imitation (Martin & Pear, 2003). Modelling has been used to teach social skills (e.g., eye contact, increasing speech duration, loudness of speech) both in multi-component packages (e.g., instructions, feedback, behaviour

rehearsal, and modelling) (e.g. Bornstein, Bellack, & Hersen, 1977), and as a treatment in itself (e.g. O'Connor, 1969), both with successful results.

When modelling is taught via the medium of video it is known as symbolic modelling and it has been suggested that symbolic modelling can be as effective as in-vivo modelling (Martin & Pear, 2003). Harward and Weissberg (1987) suggest that video is well-suited to representing social skills because it can capture and represent non-verbal communication, and thus, may be well-positioned to teach observers social cues. In addition, O'Connor (1969) suggested that symbolic modelling (observation) may be effective for children who have significant deficits. He explains that when a target behaviour is rarely displayed, too few opportunities arise where reinforcement can be used to increase it. Therefore, other intervention strategies (i.e., modelling) become more viable.

Advantages of Video Modelling for Children with ASD

Video modelling has been reported to offer many advantages in teaching skills to children diagnosed with ASD. Firstly, parents frequently report that their autistic children imitate dialogue and actions (both appropriate and inappropriate) from television and video (Nally, Houlton, & Ralph, 2000). Furthermore, as watching desired television programmes (and videos) may have been reinforcing in the past, the mere presentation of a video may be sufficient to draw a child's attention to it (Bellini & Akullian, 2007; Corbett, 2003). Thus, it is claimed that video modelling may be more effective compared with traditional learning procedures (e.g., prompting and reinforcement) for the ASD population, as identifying effective reinforcers for use in traditional learning procedures has sometimes proven problematic (Stahmer, Ingersoll, & Carter, 2003). To explain, according to Lovaas (2003), most children with developmental delays (i.e., including autism) may not increase target behaviours when social praise, social feedback, the company of others and other subtle rewards (i.e., secondary reinforcers) are delivered. That is, children with autism may be delayed in acquiring secondary reinforcers compared with children with normal development (Lovaas, 2003), and this makes identification of effective reinforcers difficult. Importantly, as television (and video) may be conditioned reinforcers for children with ASD, they may capture attention to stimuli,

which may assist learning. So, this suggests that video modelling may be effective in overcoming the attentional deficits which are reported to obstruct learning for children with ASD.

Secondly, video modelling may have the potential to overcome the impairments in observational learning as video can be repeatedly presented, thereby increasing learning opportunities. That is, children with autism who have undeveloped observational skills may require repetition to learn (Ayres & Langone, 2005). In addition, when more viewing opportunities are required, in comparison with teacher time, video modelling has been reported to be more cost effective and efficient (Ayres & Langone, 2005; Charlop & Milstein, 1989; Newman & Fuqua, 1988). In a comparison study between in-vivo and video modelling, Charlop-Christy, Le, and Freeman (2000) found that video modelling was more time and cost efficient when compared with in-vivo modelling. Therefore, video modelling may be a useful and cost effective resource in schools.

A third potential advantage for the use of video modelling with children with ASD emerges as video modelling does not require face-to-face interactions. Face-to-face interactions are frequently encountered in teaching situations which are reported to make some children with ASD uncomfortable (Corbett, 2003; Stahmer et al., 2003). Video modelling is therefore non-intrusive and well-suited for the ASD population (Corbett, 2003).

A fourth advantage results from the visual component of video. That is, it has been reported that a large percentage of children with ASD achieve superior results when learning materials are visual compared with materials that are not and/or contain auditory information (Buggey, 2005; Corbett, 2003; Quill, 1997; Shipley-Benamou et al., 2002; Wert & Neisworth, 2003). Because video modelling is a visual strategy it may be superior to strategies that do not involve visual materials.

Fifthly, video modelling has been reported to assist with the problem of stimulus over-selectivity. Stimulus over-selectivity occurs when a child responds to one component only of a compound stimulus (Lovaas, 2003). For example, a child may correctly identify a square shape but has responded to the colour of the shape, instead of the shape itself. That is, children with ASD have difficulty responding to multiple cues (Lovaas et al., 1979). It has been reported that stimulus over-selectivity

is a common problem for children with ASD (Lovaas et al., 1979) and interferes with successful learning, but is more commonly associated with lower-functioning children (Egel, Richman, & Koegel, 1981). One strategy to overcome the problem of stimulus over-selectivity has been to highlight relevant cues and minimise irrelevant cues (Charlop-Christy et al., 2000; LeBlanc et al., 2003). A zoom lense can be used to make relevant cues more obvious (Charlop-Christy et al., 2000, LeBlanc et al., 2003), or verbal descriptions of a target behaviour can be provided (Coyle & Cole, 2004). So, strategies can be used within video modelling to mediate stimulus over-selectivity and thereby increase learning.

Lastly, video modelling may be more effective than in-vivo modelling because a video screen has defined boundaries (Charlop-Christy et al., 2000). Hence, it is more likely that extraneous and non-pertinent variables do not interfere with learning, when compared with learning in the natural environment (in-vivo modelling) where such boundaries cannot be drawn (Wert & Neisworth, 2003). If video was successful in reducing stimulus over-selectivity, it would prove a very valuable tool in facilitating learning for the ASD population.

Thus, the use of video has the potential to overcome some long-standing problems that have been associated with teaching children with ASD. Most importantly, the potential ability of video to overcome the observational learning impairments in children with ASD.

Video Modelling with Children with ASD

Video modelling has become a popular intervention for children diagnosed with ASD. For the purposes of this study, previous studies in both video and in-vivo modelling conducted with the ASD population will be examined and reviewed as important findings have been reported in in-vivo modelling interventions. Thus, excluding in-vivo modelling studies conducted with the ASD population may not be beneficial to an examination of modelling for the ASD population. If an in-vivo modelling study is reviewed in the current study, it will be explicitly stated that the study involved in-vivo modelling.

Success in video (and in-vivo) modelling has been reported for the ASD population in teaching academic skills (e.g., Coyle & Cole, 2004; Delano, 2007b;

Kinney, Vedora, & Stromer, 2003), functional skills (e.g. Alcantara, 1994; Keen, Brannigan, & Cuskelly, 2007; Shipley-Benamou et al., 2002), play skills (e.g., D'Ateno, Mangiapanello, & Taylor, 2003; Jahr, Eldevik, & Eikeseth, 2000; MacDonald, Clark, Garrigan, & Vangala, 2005; Taylor, Levin, & Jasper, 1999), and social skills (e.g., Charlop-Christy et al., 2000; Charlop & Milstein, 1989; Jones & Schwartz, 2004; Maione & Mirenda, 2006; Nikopoulos & Keenan, 2004, 2007; Ogletree, Fischer, & Sprouse, 1995; Reagon, Higbee, & Endicott, 2006; Wert & Neisworth, 2003). Only, a few studies (some published after the current study began) have reported failures for some participants (e.g., Hine & Wolery, 2006; Jahr et al., 2000; Nikopoulos & Keenan, 2003; Sansosti & Powell-Smith, 2008; Scattone, 2008; Sherer et al., 2001).

Importantly, there is a large body of literature which reports that video modelling interventions have been successful in teaching a wide range of skills to children diagnosed with ASD. Few studies report a lack of improvement in targeted skills. Thus, a video modelling intervention is well placed to teach academic, functional, play, and social skills to children with ASD.

Reviews/Meta-analyses

Five reviews of the video modelling literature as it pertained to individuals with ASD have been completed. In one review of 15 studies, Ayres and Langone (2005) reported that modelling played a significant role in teaching social skills to students with ASD.

Delano (2007a) reported that 15 of the 19 video modelling studies she reviewed involved fewer than 4 participants and recommended that future research include larger numbers of participants to improve the literature. Delano also reported that for 50 of a total of 55 participants, positive gains were achieved in one or more of the skills targeted. Delano, and Ayres and Langone (2005) report that most studies targeted social-communicative behaviours. However, five studies (e.g., Nikopoulos & Keenan, 2003) which targeted social-communication skills reported equivocal results (Delano, 2007a). From these failures, Delano suggested that video modelling alone may be too weak to achieve increases in social-communications skills for the ASD population, and may need to be embedded in another intervention (e.g., self-

management) to be beneficial. In another review of social skills interventions, Scattone (2007) reported that video modelling interventions were more successful when combined with other strategies (e.g., adult prompts, tangible reinforcement). As these reviews were published after the current study began, their findings could not be considered in the design for the current study.

In contrast, Bellini and Akullian (2007) reported that when either video modelling or video self-modelling were combined in packages (e.g., video modelling and reinforcement) conflicting results occurred with regard to social-communication skills. The authors stated that further research was required in separating components to determine whether video modelling can be successful in its own right (see also Ayres & Langone, 2005; McCoy & Hermansen, 2007).

In a meta-analysis of 23 video modelling studies (video modelling and video self-modelling) which included a total of 73 participants with ASD, Bellini and Akullian (2007) reported that video modelling interventions met the criteria for an evidence-based practice. This distinction is important as video modelling is thus deemed a successful strategy with the ASD population which would promote its use. That is, organisations may require that evidence-based practices be the only practices adopted for children with ASD.

Bellini and Akullian (2007) reported that both video modelling and video self-modelling were effective in teaching individuals with autism social-communicative skills, functional skills, and behaviour functioning. From an analysis (i.e., percentage of non-overlapping data points) of maintenance and generalisation effects, moderate effects resulted for both (Bellini & Akullian, 2007). From her review, Delano (2007) reported that 14 of the 19 studies assessed maintenance, while only 10 of the 19 studies assessed generalisation, but that favourable findings were reported for both. Despite the favourable findings, if generalisation was assessed in more studies (and proved to be successful) it would improve the quality of the video modelling literature.

Bellini and Akullian (2007) reported that intervention fidelity was measured in nine of the studies, while social validity was measured in only four of the studies. According to Delano (2007a) only one study reported procedural reliability, while five measured social validity. Thus, two important procedures have been omitted

from video modelling studies. Again, both these procedures, if completed and reported, would improve the quality of the research.

It would appear that the reviews conducted are divided as to whether video modelling can achieve greater success when combined with other interventions, or whether it can achieve success in its own right. Further research is needed to determine this point. Generalisation was not tested in all interventions but when it was tested favourable findings resulted. As successful generalisation is a need for the autistic population, the literature would be strengthened if more studies tested for it. Intervention fidelity and social validity were considered important but were under-reported.

Behaviour Modelling Training in Organisational Psychology

In the field of organisational psychology behaviour modelling has been used extensively and has proven to be successful in training managers, supervisors, and counsellors (e.g., Baldwin, 1992; Bryant & Fox, 1995; Decker 1982, 1984) in complex social skills (e.g., assertiveness, dealing with employee problems, confronting others). A review of the literature in behaviour modelling training may be beneficial to determine which components (e.g., narration, multiple exemplars, use of positive and negative exemplars) have proven to be successful in teaching complex social skills. Undergraduate students or trainees are frequently used in behaviour modelling training group studies. Thus, generalising findings to the ASD population may be limited, however, it may be prudent to determine what components have been successful in other modelling studies, given the lack of component separation in the video modelling studies for the ASD population.

Generalisation

Generalisation is defined by Stokes and Baer (1977) as “relevant behaviour under different, non-training conditions (i.e., across subjects, settings, people, behaviours, and/or time) without the scheduling of the same events in those conditions as had been scheduled in the training conditions” (p. 350). Generally, it has been reported that the failure to generalise acquired skills is common among the ASD population (Lovaas et al., 1979). Video modelling may be well placed to

remedy this failure, as video scenes can depict social interactions in the natural environment (Alcantara, 1994; Charlop-Christy et al., 2000; Simpson et al., 2004). That is, the training environment is similar to the natural environment, which should make skill generalisation more likely (Stokes & Baer, 1977). In support of this suggestion, it has been reported that video modelling has assisted with generalisation of skills (e.g., Charlop & Milstein, 1989; Charlop-Christy et al., 2000). From their reviews of the video modelling literature, Bellini and Akullian (2007) and Delano (2007a) considered that the positive results attained in generalisation were important because traditional prompting techniques have not necessarily produced generalisation for children with ASD. Further, Bellini and Akullian suggested that future research focus on the use of multiple exemplars to enhance generalisation effects (Stokes & Baer, 1977). From organisational psychology, studies investigating components in behaviour modelling training have compared different combinations of multiple exemplars.

Multiple exemplars. It has been suggested that one video modelling exemplar may be enough to reproduce a behaviour, however more than one modelling example may be required to generalise a skill (Bryant & Fox, 1995). The reasoning for this claim is that a trainee is required to learn a rule when generalising which can be better derived from multiple exemplars than from a single exemplar (Bryant & Fox, 1995). In a group study, Bryant and Fox (1995) compared two types of learning points (rule-code versus summary label) and multiple exemplars (single exemplar versus multiple exemplars) on generalisation of a supervisory skill. Learning points are written verbal descriptions of the model's key behaviours (Decker, 1984). Decker (1984) describes summary learning points (summary label) as labels for the essential elements of the model's key behaviours (e.g., good eye contact). Rule-oriented (rule-code) learning points are described as the principles underlying a model's performance (e.g., when speaking, look directly at the person) (Decker, 1984). Overall, the multiple exemplar, rule-code combination produced the greatest generalisation (Bryant & Fox, 1995).

Video modelling studies. In the video (and in-vivo) modelling literature with the ASD population, it has been claimed that the use of multiple exemplars have contributed to successful skill generalisation (e.g., Charlop & Milstein, 1989; Corbett,

2003; Hine & Wolery, 2006; Jahr et al., 2000; Maione & Mirenda, 2006). However, in the above studies the use of multiple exemplars was not investigated as the independent variable.

Conclusion. Thus, from organisational psychology, multiple exemplars have been shown to enhance generalisation. Further, Stokes and Baer (1977) recommend the use of multiple exemplars to promote skill generalisation. However, from the video modelling literature with the ASD population, the claim that multiple exemplars have contributed to successful generalisation should be viewed with caution, given the lack of comparison between the use of multiple exemplars versus a single exemplar in any study.

Negative and positive exemplars. Stokes and Baer (1977) suggested that the rule in pursuing maximum generalisation was diversity in training exemplars. One way to increase diversity is to include negative and positive modelling scenarios. Traditionally, it was thought that the use of negative exemplars in training procedures interfered with the acquisition of positive behaviours (Baldwin, 1992; Newman & Fuqua, 1988). In a group study, Newman and Fuqua (1988) compared negative modelling only; positive modelling only; and a combination of negative and positive modelling in teaching counselling and interviewing skills to graduate students. They found that, neither positive nor negative displays outperformed each other. Thus, their study jeopardises the assumption that negative modelling displays interfere with acquisition of positive behaviours (Newman & Fuqua, 1988).

In another group study, Trimble, Nathan, and Decker (1991), found that including a combination of positive and negative models did not interfere with replication of target behaviours. Further, Trimble et al. tested for proactive (i.e., negative followed by positive modelling display) and retroactive interference (i.e., positive followed by negative modelling display) and found no evidence of either.

Therefore, it was shown in both the above studies that using negative modelling scenarios did not produce inferior learning. It has been suggested that a mix of negative and positive modelling scenarios will prove more successful in skill generalisation (see Baldwin, 1992 below) and as both the Newman and Fuqua (1988) and the Trimble et al. (1991) studies did not test for generalisation it is unknown

whether the mix of negative and positive modelling scenarios would have resulted in superior generalisation.

Baldwin (1992) stated that generally when trainees enter a training programme they have a history of performing the target behaviours incorrectly and/or have misconceptions about what comprises effective behaviour. Thus, Baldwin states trainees must first 'unlearn' ineffective behaviours, as the goal of successful training is not only to teach effective behaviour but also to eliminate ineffective behaviours. Accordingly, Baldwin suggested that one way of making trainees aware of their ineffective behaviour was to use negative exemplars.

Baldwin (1992) studied two methods (i.e., multiple scenarios, and positive and negative exemplars) to enhance generalisation. That is, one positive exemplar; two positive exemplars; a negative and a positive exemplar; two positive and two negative exemplars were manipulated. Baldwin found reproduction was superior when one modelling scenario was used, compared with the use of two modelling scenarios. Further, both negative and positive exemplars, either with or without multiple exemplars, resulted in superior generalisation, but inferior reproduction of the skill, compared with the use positive exemplars only (Baldwin, 1992). Baldwin's findings conflict with what Trimble et al. (1991) found. In that study, the use of negative exemplars did not interfere with behavioural reproduction. Newman and Fuqua (1988) used pen and paper tests to measure interference with learning and thus a comparison between Baldwin's study and the Newman and Fuqua study on a measure of reproduction cannot be made. However, it can be said that Baldwin's study compared reproduction with generalisation, whereas the Trimble et al. measured behavioural reproduction only and Newman and Fuqua measured learning only. Although reproduction was inferior in the mixed negative and positive modelling conditions when compared with the positive modelling conditions, Baldwin reported that it did not have a significant detrimental effect.

Importantly, Baldwin (1992) offers (from the implications of his study) that where behaviour reproduction is the goal and variability is not desirable (e.g., training to use a power tool safely) the use of multiple exemplars and/or positive and negative examples may be inappropriate. The findings from a meta-analysis of 117 behaviour modelling training studies support Baldwin's findings (Taylor, Russ-Eft, & Chan,

2005). Namely, the superiority of a mix of positive and negative exemplars for skill generalisation, and their inferiority in skill reproduction (Taylor, Russ-Eft et al., 2005).

Collectively, the Newman and Fuqua (1988) and the Baldwin (1992) studies challenge findings from a previous group study by Alssid and Hutchison (1977). In that study, positive and negative modelling displays were compared with positive modelling displays. It was reported that the purely positive display was superior (Alssid & Hutchison, 1977). Both Newman and Fuqua, and Baldwin point to methodological flaws in the Alssid and Hutchison study, as did Alssid and Hutchison. More particularly, the number of exemplars in each condition was unequal and hence, participants in the purely positive condition received more task-relevant information than participants in the mixed positive and negative condition (Baldwin, 1992; Newman & Fuqua, 1988). Baldwin also notes that generalisation of the skills was not tested and considers the use of positive and negative exemplars more likely to enhance generalisation. Therefore, the Alssid and Hutchison study does not jeopardise the findings (e.g., Baldwin, 1992; Newman & Fuqua, 1988; Trimble et al., 1991) that negative exemplars do not interfere with learning.

Video modelling studies. Studies in the video modelling literature (e.g., Ogletree et al., 1995; Simpson et al., 2004) have asked participants to discriminate examples of target behaviours from non-examples but the authors did not manipulate negative exemplars or compare their use with positive exemplars. Further they did not report results relative to correct/incorrect discriminations.

Video modelling teaching videos. Currently, modelling videos (e.g., Murdock & Khalsa, 2003; TD Social Skills, 2003) are available to the public that teach social skills to children with ASD using positive and negative exemplars. However, the use of positive and negative exemplars has not been evaluated in the literature. It would be prudent to investigate the effect of positive and negative exemplars on learning outcomes for children with ASD.

Conclusion. The literature from organisational psychology supports the use of negative and positive exemplars, particularly to enhance generalisation. Further, their use was not found to interfere with reproduction (to any great extent). It would be valuable to extend the current literature in video modelling to evaluate the use of

positive and negative exemplars with the ASD population for three reasons. Firstly, skill generalisation has proved problematic with the ASD population but is an important outcome. Secondly, current video modelling teaching videos using positive and negative exemplars have not been evaluated, and thirdly, to date no studies in the video modelling literature with children with ASD have manipulated the use of positive and negative exemplars.

Narration

It has been suggested that the modelling component in behaviour modelling training may be the weakest component (Mann and Decker, 1984). Coyle and Cole (2004) reported research that found that narration or supplementary information given to participants, which drew their attention to the target behaviours, assisted participants to attend to what was relevant. Thus, modelling with additional information may improve learning outcomes.

It has been found that narration combined with video training, produces superior learning compared with video training without narration, and video training with written information (Bashman & Treadwell, 1995).

Some studies in the video modelling literature have included narration. For example, Coyle and Cole (2004) provided verbal descriptions of target behaviours and reported success in reducing off-task behaviour for participants in the study. Coyle and Cole suggested that the verbal descriptions assisted participants to attend to relevant cues.

Alcantara (1994) used step-by-step narration (and instructions) in the modelling videos used in his study to teach 3 participants with autism grocery-purchasing skills. Alcantara reported that gains were made, however in-vivo prompting and reinforcement were required to be added to the intervention before the participants reached criterion.

Apple et al. (2005) included narration when teaching compliment-giving responses and initiations to four children with autism. An adult provided rules for giving compliments (e.g., “When we see our friends playing with things that we like, like airplanes, we can say ‘Neat airplane!’”) (Apple et al., 2005, p. 35). However, in their study, a self-management procedure was also required for initiation of

compliments to occur across all participants. Furthermore, the authors reported that they were unable to determine which component was most successful (i.e., video modelling or embedded rules).

From the behaviour modelling training literature above, it has been shown that narration can increase learning. The video modelling literature for children with ASD is less convincing, given that narration was not the independent variable manipulated and conflicting results occurred. McCoy and Hermansen (2007) suggested that future research investigate, among other things, narration, to ascertain how it influences success in video modelling interventions.

Models

The type of model used in modelling displays influences imitation of modelled behaviour. It has been found that model similarity (to an observer) has the greatest influence (Martin & Pear, 2003). Thus, for children, peer modelling should be superior to adult modelling, because compared with adults, peers are more similar to the child observer (Bellini & Akullian, 2007). Buggey (2005) reports previous researchers who have suggested that models who are of similar age, have comparable attributes, and are functioning at a level slightly above the observer are the most effective. However, Egel et al. (1981) suggested that similarity to age and sex is sufficient.

Stokes and Baer (1977) recommend the use of peers to enhance generalisation. That is, as peers are usually found in generalisation settings, using peers in training settings may assist skill generalisation (Stokes & Baer, 1977). In support of this Corbett and Abdullah (2005) suggest that social interactions with other children are frequently targeted, so using peers in training is the logical choice.

From the video modelling literature with the ASD population, the participants themselves (i.e., self), adults, peers, point-of-view, animated, and mixed models (i.e., adults, peers, or siblings) have been used. In point-of-view modelling (e.g., Hine & Wolery, 2006; Schreibman, Whalen, & Stahmer, 2000; Shipley-Benamou et al., 2002), an actors hands are shown and/or the view from the participant's perspective.

Buggey (2005) reports success when the participants themselves have acted as the video models (i.e., self-modelling). There are two ways in which self-modelling

can occur. The first, is time-consuming, and involves videoing a child and editing out the undesirable behaviours (Buggey, 2005). In some cases, Buggey (2005) claims, this may require videoing over several days to ensure desirable behaviours are filmed. The second method involves videoing a child role-playing the target behaviour. It has been suggested that children will pay more attention to themselves which may have the potential to make video self-modelling more successful compared with the use of other models (Stahmer et al., 2003). That is, attention is thus directed towards the behaviour targeted for learning. Delano (2007a), in her review, reported positive results for the five studies that used self-modelling. However, despite the positive results, Bellini and Akullian (2007) reported low generalisation effects for video self-modelling, compared with moderate generalisation effects for video modelling. Thus, there appears to be some disagreement regarding the use of self-modelling to achieve superior gains in generalisation of a skill.

Three studies have compared model effectiveness for children with ASD. The first study by Sherer et al. (2001) compared self or other (peer model) as models to determine which was superior with five boys. Four were reported to be autistic. The second study by Jones and Schwartz (2004) compared the effectiveness of same-age peers with normal development, siblings, and adults as in-vivo models for three pre-schoolers with ASD in teaching novel language skills. Finally, Ihrig and Wolchik (1988) compared the effectiveness of a same-sex adult, and peer model with normal development, in-vivo, in teaching four autistic boys an expressive language task. All three studies reported no distinct preference for any model was shown by participants.

McCoy and Hermansen (2007) reviewed 34 studies to determine the most effective model types. They found that success was obtained for individuals with autism regardless of the model type but suggested that self and peer models had a greater impact when compared with adults, mixed models (adults, siblings, peers) and point-of-view modelling. McCoy and Hermansen (2007) suggested that the use of peer or adult models may be preferred over self-models because of the extensive editing that may be required for video self-modelling (see also Ayres & Langone, 2005).

Accordingly, thus far, the literature comparing model characteristics reveal no distinct preferences for models by children with ASD. However, the results from one review indicate superiority of self and peer models when contrasted with adults, mixed models, and point-of-view modelling. Further there appears to be a rationalised preference for using peers as models based on model/observer similarity, enhancement of generalisation, and ease of video creation.

Comparative Learning Strategies

In order for video modelling interventions to be selected over other intervention strategies, they would need to demonstrate equal or greater success when compared with other intervention strategies. Bandura (1977) suggested that acquisition of behaviour via modelling is faster compared with acquisition via trial and error because in observational learning an observer is spared the effort (and needless errors) in learning.

In an in-vivo modelling study which compared observational learning with traditional trial and error learning (i.e., no prompting or correction procedures), it was found that the modelling condition produced superior results (Charlop, Schreibman, & Tryon, 1983). The authors suggested that modelling was more successful because it contains less structure than trial and error learning (Charlop et al., 1983). Thus, modelling was more successful than a traditional trial and error procedure.

In another in-vivo modelling study, Egel et al. (1981) found modelling was instrumental in achieving skill acquisition where a prompting and reinforcement (social praise) procedure was not. That is, in baseline prompting and reinforcement did not increase target behaviours however modelling (with prompting and reinforcement) did. They attributed success to the use of peer models and suggested peers were effective because they increased attention to the stimuli, while the therapists (in baseline) did not. In this study, a combination of modelling, prompts and reinforcement proved superior over prompts and reinforcement alone.

Like the Egel et al. (1981) study, Charlop and Milstein (1989) also found that traditional procedures (e.g., prompting and reinforcement by teachers, parents, speech therapists and staff at an after-school programme) failed to teach 3 participants conversational skills. However, when video modelling was introduced, all 3

participants quickly acquired the modelled conversational speech (Charlop & Milstein, 1989). The authors suggested that because children with autism have exceptional rote memories, and some respond echolalically, video modelling played to their strengths, which enabled acquisition. Thus, for these participants prompting and reinforcement procedures proved inferior.

Like the above studies, Wert and Neisworth (2003) reported failure of discrete trial training to teach four pre-school participants requesting behaviour, however when video self-modelling was introduced success was obtained. They reported 3 of the 4 participants liked to watch themselves on the video, which secured their attention to the stimuli, which in turn contributed to the success of the intervention. This study demonstrates the superiority of video self-modelling over discrete trial training.

In a comparison study between two methods of modelling, Charlop-Christy et al. (2000) found video modelling was superior to in-vivo modelling. In addition (like Egel et al., 1981) they used prompting and reinforcement in the baseline phase to determine whether traditional procedures would produce criterion performance, and found they did not. Charlop-Christy et al. suggested that in-vivo modelling may have produced inferior results because the participants traditionally learned via in-vivo modelling. That is, in the past in-vivo modelling may have been associated with prompt dependence, and intermittent and inadvertent reinforcement of disruptive behaviours which interfered with learning. It would appear from this study, that video modelling is superior when compared with in-vivo modelling. However, in another comparison study, Gena, Couloura, and Kymissis (2005) found no differences between in-vivo and video modelling when they were used as correction procedures. Thus, the findings from the Gena et al. study are contrary to the findings from the Charlop-Christy et al. (2000) study. However, Gena et al. recommended replication of their study, given a possible confound (i.e., sequence effects).

In a rare group study, Kroeger, Schultz, and Newsom (2007) found that the group that received a direct teaching strategy using video modelling made more gains in pro-social behaviours that the supervised play activities group. They attributed success to the intensity of instruction and repetition involved.

In a recent study, Murzynski and Bourret (2007) found for the single participant in their study that a two-component package (i.e., video modelling and least-to-most prompting) was superior compared with least-to-most prompting alone. In another comparison study, Keen et al. (2007) found that video modelling and operant procedures (i.e., prompting and reinforcement) was superior compared with operant procedures alone. The authors suggested that as the participants in the study were non-verbal the visual rather than the verbal component may have assisted learning.

The literature above shows that video modelling interventions with the ASD population can be more successful when compared with other intervention strategies, particularly traditional procedures. Thus, this should encourage the use of video modelling interventions, over traditional procedures.

Multi-component Packages

As already mentioned, the reviewers of video modelling studies questioned whether video modelling could be successful in its own right or was required to be embedded in other interventions to be successful. Few studies (e.g., Charlop-Christy et al., 2000) investigated video modelling alone as an intervention strategy (i.e., without reinforcement). Studies that investigated video modelling with other intervention strategies include the study by Thiemann and Goldstein (2001). They used social stories, written text cues, role plays, and video feedback to teach five children with autism social skills. Although all 5 participants showed improvement most gains were small. The authors reported for some participants generalisation was not achieved and for most participants maintenance was not achieved.

Coyle and Cole (2004) used video self-modelling with self-monitoring to reduce off-task behaviour at school for 3 participants with successful results. They attributed success to participant attention to the stimuli. That is the self-modelling video secured their attention as did the materials in the self-monitoring component. Reeve, Reeve, Townsend, and Poulson (2007) reported success in using video models, multiple exemplars, and prompting and reinforcement to teach four children

with autism helping behaviours (e.g., locating objects, putting items away, carrying objects).

Sansosti and Powell-Smith (2008) used computer-presented social stories with video models to teach social communication skills to three children. However, the intervention was modified for two participants to include prompting in order for the target behaviours to increase.

The above studies show that utilising many (or more than one) components does not necessarily guarantee intervention success. Moreover, given the number of components included in the interventions above, most of the authors advised caution in interpreting the results, and recommended future research investigate each component to determine which components are the most effective.

Pre-requisites for Successful Video Modelling Interventions

For video modelling to be successful an observer must be capable of attending to the video (Buggey, 2005; Shipley-Benamou et al., 2002). Furthermore, demonstration of imitation skills, ability to follow one to two-step instructions, and visual learning strengths may be pre-requisites for successful video-modelling interventions (Shipley-Benamou et al., 2002). Garfinkle and Schwartz (2002) make the point succinctly. Successful observational learning requires successful imitation (Garfinkle & Schwartz, 2002).

In the review of video model types, McCoy and Hermansen (2007) suggested that imitation and attentional skills were two important pre-requisites for success in video modelling interventions but reported that of the 34 studies reviewed no consistency in reporting these pre-requisites was found.

In the Nikopoulos and Keenan (2003) study 3 of the 7 participants failed to make gains. All children were reported to have restricted imitation skills (Nikopoulos & Keenan, 2003). In a later study, Nikopoulos and Keenan (2007) reported that for the 4 autistic participants, all had limited imitation skills, yet all were successful in imitating the video models. In the later study, success was first obtained in imitation of one or two behaviours before a more complex chain of behaviours was imitated successfully. Thus, a child can be taught generalised imitation through the

medium of video. The authors suggested the participants may have increased their attention to the target behaviours because of the video medium.

The later study by Nikopoulos and Keenan (2007) is important because children with ASD frequently have limited or delayed imitation skills (Lovaas, 2003) and their findings imply that video (which can secure attention) may be an alternative method to teaching imitation (cf. discrete trial training). However, the predominant view is that video modelling be selected for children who can imitate non-verbal actions.

Procedural Differences

Considerable differences in the procedures used in video modelling interventions have been shown in the literature, most importantly with regard to the use of reinforcement during baseline and intervention phases. Generally, no reinforcement is delivered in generalisation and maintenance phases.

Some studies, for example, report no experimenter-implemented reinforcement, or correction procedures, throughout all phases of the intervention (e.g., Bellini et al., 2007; D'Ateno et al. 2003; MacDonald et al., 2005; Reagon et al., 2006; Wert & Neisworth, 2003).

One study (Murzynski & Bourret, 2007) delivered reinforcement (i.e., praise and an edible) following the completion of each trial. That is, reinforcement was not contingent on correct responding. Some studies use verbal praise and edibles for on-task behaviour (e.g., Ihrig & Wolchik, 1988) and to maintain responding (e.g., Nikopoulos & Keenan, 2003) but not for modelled actions in the intervention phase (e.g., Charlop et al., 1983; Hine & Wolery, 2006). For example, Charlop and Milstein (1989), in teaching three boys with autism conversation skills, acknowledged appropriate conversational responses in the baseline and training phases by responding "Yeah" "Uh-huh" and "That's right," so that the child would continue talking, while an edible reinforcer was delivered on a variable-interval 1-min schedule for good sitting, eye-contact and working hard. The authors reported that during baseline and training, praise and an edible reinforcer were delivered if a completed conversation occurred, but were delivered for sitting still, attending and talking. Like the Charlop and Milstein study, Jones and Schwartz (2004), during the

in-vivo modelling intervention phase (in which a question answering task was taught) delivered verbal feedback ("that's right") to the 3 participants in their study when the participants answered correctly. For the Charlop and Milstein, and Jones and Schwartz studies, the use of feedback in the form of "that's right" may have been instrumental in behaviour gains. For the Charlop and Milstein study, although the feedback was available in baseline, few (if any) correct responses occurred (hence it was not delivered), and thus, it may be questionable whether during the modelling treatment the feedback served as a reinforcer for correct responses (i.e., its delivery increased correct responses).

In the studies by Charlop-Christy et al., 2000, and Egel et al. (1983) prompting, correction, and reinforcement were delivered during baseline to determine whether the use of traditional procedures would result in acquisition of the tasks. Once it was established traditional procedures were not effective, video modelling training began without prompts or reinforcers. Thus, both studies used video modelling when other procedures failed.

Some authors report delivery of reinforcers (e.g., praise and an edible) for correct responding during the training stage (e.g., Gena et al., 2005; Ihrig & Wolchik, 1988; Kinney et al.,2003; Shipley-Benamou et al., 2002). Thus, the above group of studies used a two component procedure. That is, video modelling and the delivery of reinforcement. In the probe designs by Jahr et al. (2000) and Taylor et al. (1999) reinforcers were delivered during training, but not in probes.

Few studies report whether in-vivo or video models received reinforcers for correct responses. Studies that have reported that correct responses by models were reinforced include studies completed by Charlop et al. (1983), Ihrig and Wolchick (1988), Keen et al. (2007), Jones and Schwartz (2004), and Kroeger et al. (2007). Thus, if no reinforcement was delivered to the models, then an observer's imitation of the model's behaviour could not be considered vicarious learning/reinforcement (Bandura, 1977).

The variation in procedures shown above makes comparison between video modelling studies problematic. Although, for some children with ASD, it was shown that the use of reinforcement did not increase target behaviours, the use of reinforcement is a traditional procedure for increasing target behaviours and its

success is evidenced by a large body of literature. Overall, the procedural differences make it difficult to determine which procedure was the most effective.

Purpose

Given the success shown by the literature in video modelling, and given its superiority when compared with other procedures, video modelling is well positioned to teach children with ASD social skills. Video modelling fits well when considering the deficits and visual strengths of ASD. Further, it has been shown that video secures attention to the stimuli (e.g., Bellini & Akullian, 2007) and thus may overcome the reported attentional deficits which interfere with observational learning in children with ASD (Lovaas et al., 1979).

Research separating the components in video modelling (e.g., excluding reinforcement) has been recommended, to determine whether video modelling can be successful in its own right (Ayres & Langone, 2005). In addition, research with larger numbers of participants has been recommended (Delano, 2007a).

Generalisation is an area of need given that children with ASD frequently fail to generalise acquired skills across settings, people, stimuli and time (Lovaas et al., 1979). Narration has proven to be successful in assisting learning (e.g., Bashman & Treadwell, 1995). The use of multiple exemplars, particularly the use of positive and negative exemplars have been found to enhance generalisation in behaviour modelling training, and have not been found to interfere significantly with learning (e.g., Baldwin, 1992). Hence, the use of multiple exemplars, particularly the use of positive and negative exemplars may prove to be valuable in enhancing skill generalisation for children with ASD. Further, it would be valuable to evaluate the use of positive and negative exemplars as they are currently used in commercial video modelling teaching videos (e.g., TD Social Skills, 2003).

Given the above findings and recommendations, the main aim of the present study was to investigate the use of two positive exemplars, and a combination of one positive and one negative exemplar in video modelling, to determine how it affects acquisition and generalisation of social skills in children with ASD. A subsidiary aim of the present study was to investigate the use of narration and how it affects skill acquisition and generalisation. However, to aid component separation, the videos

will be presented without narration in the first instance. If participants fail to learn with video modelling alone, then narration will be added to the video modelling intervention.

Methodological Considerations

It is noted that where two conditions are being compared the recommended research design is an alternating treatments design. However, an alternating treatments design is prone to order and sequence effects and in the current study, avoidance of both is desired. Charlop-Christy et al. (2000) used a multiple baseline design when comparing two conditions and demonstrated experimental control. Thus, a multiple baseline design will be used in the current study. A minimum of four baselines (tiers) will be scheduled for each multiple baseline design to provide a convincing demonstration of the effects of the independent variable (Barlow & Hersen, 1984; Murphy & Bryan, 2001). If both tasks are experienced by a participant within the same session then tasks will be counterbalanced to counter any possible order effects. For example, if one task is experienced in first order in one session, then in the following session it will be experienced in second order.

A multiple-probe technique will be used in the baseline phases of the experiment to reduce opportunities for extinction, boredom, fatigue, or any other effects that may occur when continuous measurement is used in extended baselines (Horner & Baer, 1978). Baseline generalisation probes will be collected to ensure that the target skills are not already present in the generalisation settings (Horner & Baer, 1978).

Participants will be matched as closely as possible in age in the baseline designs (Murphy & Bryan, 2001). The settings for the study will be a room, either in the participant's home or at the participant's school. That is, despite two different settings (school and home), the experiment will be conducted in a room in both settings. Hence environmental conditions will be considered to be identical (Barlow & Hersen, 1984).

As previously mentioned, no preference has yet been found by children with ASD as to model type (i.e., adult, sibling, peer, self). Accordingly, in the current study, in line with the recommendations made by researchers, peers will be used to

increase the likelihood that generalisation of trained behaviours across people and settings occurs. Natural maintaining contingencies will be used (Martin & Pear, 2003; Stokes & Baer, 1977). More particularly, positive consequences (i.e., social praise) will be shown in the modelling videos following target behaviours and will be made available to the participants following imitation of the target behaviours. No preference assessments for reinforcers will be conducted. That is, it is not intended that preferred reinforcers be used to ensure that any intervention success is attributable to the video modelling component and not to a reinforcement component.

No more than two exemplars of a target skill will be used as Stokes and Baer (1977) suggested that two exemplars may be sufficient to generalise a skill. Further Baldwin (1992) cited research which indicated that when more than two exemplars were used learning outcomes decreased. The exemplars for the right/right video modelling condition will be different. That is, the same exemplar will not be viewed twice. This will guard against the condition being labelled a practice condition. It may be predicted that practice conditions will be superior to other conditions which do not include practice (Trimble et al., 1991). No retroactive nor proactive interference for the mixed negative and positive exemplars was found by Trimble et al. (1991). Thus, the exemplars in both conditions will be counterbalanced.

Prerequisite skills will be tested. That is, the ability of a prospective participant to attend to a television screen, his/her ability to imitate non-verbal actions, and follow two-step directions (Shipley-Benamou et al., 2002) to ensure that the video modelling strategy results in success for the participants.

Both intervention fidelity and social validity will be measured in accordance with the reviewers recommendations (e.g., Delano, 2007a). Generalisation probes and maintenance probes will be conducted to improve the quality of the video modelling literature (Delano, 2007a).

METHOD

Participants and Selection of Target Behaviours

The University of Waikato Psychology Department Research and Ethics Committee gave consent for this study. An advertisement for participants was placed in a newsletter distributed by the local branch of Autism NZ (see Appendix A for copy advertisement). When families contacted the author, a letter (see Appendix B for copy letter), an information sheet (see Appendix C for copy information sheet), and a consent form (see Appendix D for copy consent form) were forwarded to them. On receipt of a signed consent form, an interview with the child's parents was arranged to confirm that the child met the selection criteria, and to select social skills for training. A social skills list (see Appendix E for copy social skills list) was used as a guide to discuss competencies. It was intended that the behaviours selected for training addressed an area of need and were not present in each child's current behavioural repertoires.

Children were selected if they were diagnosed with Autism Spectrum Disorder (ASD); were aged between 5 and 14; were verbal (i.e., could produce sentences); could attend to a television screen for a minimum continuous period of 10 min as reported by their parents, and could imitate two-step actions (e.g., jump, clap hands) either, five consecutively with 100% accuracy, or a total of seven with 80% accuracy (see Appendix F for the list of two-step actions tested).

One boy, who was 15 years 10 months old, did not meet the age criteria but was accepted into this study. He was accepted to make the study more robust (i.e., to increase the number of participants). Seven children from diverse cultures (i.e., NZ European, Filipino, NZ Maori, Indian, and European) and aged between 5 and 15 years (at the beginning of the study) participated in this study. The names of all participants have been changed to protect their identities. A pre-baseline test was arranged with each participant to ensure that the behaviour(s) selected for training were unknown.

Matthew

When data collection began Matthew was 10 years 6 months old. Matthew was diagnosed with ASD by a developmental paediatrician at 3 years of age, and with Attention Deficit Hyperactivity Disorder (ADHD) by a psychologist at 6 years of age. Both paediatrician and psychologist were employed by a local assessment agency, and did not agree on his diagnosis. Matthew attended a regular classroom in a regular school, and was not attending any social skills programmes. Matthew was prescribed methylphenidate (also known by its trade name, Ritalin) and was given 10-mg at his request (i.e., Matthew's decision). His parents reported that developing friendships was important to Matthew however he struggled to recognise the feelings of others and was unaware of social boundaries. In addition, Matthew's parents reported that in conversation, Matthew often butted in, talked in monologues, and verbalised his competencies (e.g., "I'm better. You're useless").

In conjunction with Matthew's parents, the target behaviour selected was conversation cue discrimination. More particularly, the target behaviour was divided into two tasks. The first task was discriminating good (e.g., pausing to let the listener speak) and bad (e.g., talking in monologue fashion) conversation cues and will be referred throughout this study as good conversation. The proposed second task was discriminating polite (e.g., "You swim really well") and rude (e.g., "I could beat you in that Playstation® game anytime") comments. However, in the pre-baseline test Matthew demonstrated that he could discriminate polite and rude comments and so discriminating interested cues (e.g., listener asking a question) and bored cues (e.g., listener not making eye-contact with speaker) in conversation was substituted. A selection of interested and bored cues were tested and those producing incorrect responses were selected for training. Throughout this study, this task will be referred to as interested/bored. The target behaviour and tasks are described in more detail in Tasks, Videos and Models; and in the Procedure.

Zac

When data collection began Zac was 10 years 11 months old. Zac was diagnosed with ADHD and Oppositional Defiant Disorder (ODD) by a developmental paediatrician at a local assessment agency at 6 years of age. He was

diagnosed with ASD at 10 years of age by a psychiatrist at another local assessment agency. He was prescribed 1-mg of risperidone (also known by its trade name, Risperdal) once per day for ASD and imipramine (also known by its trade name, Tofranil) for sleep disturbances. He received 3 hr of adult assistance weekly for recreational activities. He attended a special needs class in a regular school. Zac was articulate but was reported by his mother to make conversational mistakes (e.g., butting in).

The target behaviour selected for Zac was discriminating good (e.g., turn-taking) and bad (e.g., butting in) conversation cues. The target behaviour will be referred to as good conversation. The target behaviour was divided into two tasks, each containing three mixed interested and bored cues. The tasks will be referred to as good conversation 1 and good conversation 2. More detail is provided in Tasks, Videos and Models; and in the Procedure.

Jack

When data collection began Jack was 14 years 11 months old. Jack was diagnosed with Asperger's Disorder by a psychologist at a local assessment agency at 8 years of age. He attended a regular class, with the support of a teacher aide, in a regular school. Jack was prescribed 1000-ml of carbamazepine (also known by its trade name, Tegretol) twice daily for epilepsy. Jack received 2 hr of adult support weekly for recreational activities (e.g., Ten-pin bowling). Jack's parents reported that Jack giggled when people coughed. In addition, Jack's parents reported that developing friendships (i.e., making friends) was important to Jack.

In the initial parent interview, when the author tested the entry skills (i.e., Jack's ability to produce sentences, and imitation of two-step actions) she observed that Jack did not make eye-contact with her. Jack's sister confirmed that Jack generally did not make eye-contact with his peers at school. Eye-contact was selected for training via video modelling as a lack of eye-contact may not have been conducive to forming peer friendships. Teaching Jack to emit an appropriate response to coughing was also targeted. The target behaviour incorporating both skills will be referred to as manners. The tasks will be referred to as eye-contact and correct response to coughing.

Initiating conversation was selected as the proposed second target behaviour to assist in friendship formation. However, in the pre-baseline test (e.g., a picture of a man holding a fish was shown to Jack and he was asked what he could say to the man) Jack showed a high level of correct responding and hence it was abandoned. As correct identification of interested and bored cues may help to form and maintain friendships, the interested/bored task, previously described was substituted. Jack did not respond correctly to any cues in a pre-baseline test. The target behaviour was divided into two tasks, each containing three mixed interested and bored cues. The tasks will be referred to as interested/bored 1 and interested/bored 2. More information is contained in Tasks, Videos and Models; and in the Procedure.

Paul

When data collection began Paul was 15 years 11 months. Paul was diagnosed with ASD by a psychologist at a local assessment agency when he was 7 years old. Paul was prescribed sodium valproate (also known by its trade name, Epilim) and lamotrigine (also known by its trade name, Lamictal) twice daily for seizures. Paul attended a special needs class in a regular school and was not participating in any social skills programmes. Paul's mother wanted Paul to learn to initiate and maintain a short conversation when people came to the house.

The proposed target behaviour selected was conversation skills. It was divided into two tasks, initiation of conversation (described previously for Jack), and reciprocal statements/questions (e.g., Paul was asked "What's your favourite TV programme? Paul was required to answer and ask the author the same question). However, in the pre-baseline test for both tasks, Paul showed a high level of correct responding. The interested/bored target behaviour, previously described, was substituted as Paul did not respond correctly to any cues in a pre-baseline test. It will be referred to as interested/bored. The target behaviour was divided into two tasks, each containing three mixed interested and bored cues. The tasks will be referred to as interested/bored 1 and interested/bored 2. More detail is provided in Tasks, Videos and Models; and in the Procedure.

Frances

When data collection began, Frances was 8 years 6 months old. Frances was diagnosed with ADHD and ODD by a developmental paediatrician at a local assessment agency at 5 years of age, and with ASD at 7 years of age. Frances was further diagnosed at 6 years of age as gifted. Frances was prescribed methylphenidate (10-mg of Rubifen every morning, and 20-mg Rubifen SR twice daily), both for ADHD. Frances attended Brownies weekly for 2 hr, gymnastics weekly for 1 hr, tennis twice weekly for 2 hr, a one day school for gifted children 1 day weekly, and horse riding weekly. Frances attended a regular classroom in a regular school. Frances was reported by her mother and teachers as dominant (i.e., directed play in play situations), controlling and aggressive towards her peers, and was reported to have no friends. In addition to changing the above behaviour, Frances' mother desired that conversational skills were targeted as she reported that Frances frequently talked in monologue fashion, rather than engaging in conversational turn-taking.

The target behaviours selected for Frances were turn-taking in play; and discriminating good and bad cues in conversation (described previously). As Frances' mother reported that Frances enjoyed playing schools and doctors, the play activity selected for training the turn-taking behaviour was schools, while playing doctors was selected for the generalisation probes. The target behaviours will be referred to as turn-taking and good conversation. Good conversation was divided into two tasks, each task containing a mix of good and bad cues. The tasks will be referred to as good conversation 1 and good conversation 2 and are described in more detail in Tasks, Videos and Models; and in the Procedure.

Brian

When data collection began Brian was 5 years 5 months old. He was diagnosed with ASD by a clinical psychologist at a local assessment agency at 3 years of age. Brian received loratadine (also known by its trade name, Claratyne) twice daily for dust mite allergies, and received promethazine (also known by its trade name Phenargan) in emergencies for food allergies. Brian was on a modified specific carbohydrate diet. Brian attended kindergarten 15 hr per week and completed

18 hr per week of early intensive intervention therapy. He engaged in child-led play with therapists for a minimum of 10 hr weekly. He received swimming lessons, and rode horses, both weekly for one half hour. Brian spoke in sentences, but throughout this study, Brian was not observed by the author to emit more than three sentences consecutively. Brian was due to begin school when he was 6 years old and his mother reported that Brian lacked road safety skills. The school Brian was to attend was not fenced. Attempts had been made to teach Brian to cross the road safely, without success.

The target behaviour selected for Brian was road safety. It was divided into two tasks, referred to as ball retrieval (i.e., Brian was required to ask the teacher for help to retrieve a ball that had gone across the road) and road crossing (i.e., Brian was required to check for cars and cross the road safely with the teacher at his side). The purpose of this study was to compare two exemplars of the right way with one exemplar of the right way and one exemplar of the wrong way. It was considered a risk to show the wrong way while teaching road safety on the actual road (see Baldwin, 1992). This risk was pointed out to Brian's mother, but because teaching road safety was important, given the lack of fencing at Brian's proposed school, Brian's mother was insistent that the skill was taught. The author and Brian's mother agreed to teach road safety in a toy play setting, because of ethical considerations. That is, for the reason previously stated. Importantly, Steinborn & Knapp (1982) successfully taught road safety to a 10 year old girl with autism using a model of the road and dolls. More detail of the tasks for Brian is provided in Tasks, Videos and Models; and in the Procedure.

Jacob

Jacob was a late entry into the study. Data collection began approximately 3 months after all other participants. When data collection commenced Jacob was 8 years 5 months old. At 5 years of age, Jacob was diagnosed with ASD by a paediatrician and psychologist at a local assessment agency. He attended a regular classroom in a regular school. He was not prescribed any medicine and was not attending any social skills programmes. He was reported by his teachers to have difficulty with comprehension tasks. More particularly, his parents reported a lack of

comprehension regarding questions. Throughout this study, it was observed by the author that Jacob's conversational speech was sometimes semantically incorrect (e.g., "My Christmas is eating something").

The target behaviours selected for Jacob were oral comprehension and conversational reciprocity and will be referred throughout the study as such. The oral comprehension target behaviour was a partial replication of the target behaviour of the same name in the study by Charlop-Christy et al. (2000). The oral comprehension target behaviour was divided into the same two tasks, as for the Charlop-Christy et al. (2000) study. For the first task, a 'when' and a 'why' question was asked following the reading of each of four, three-line stories. The task will be referred to as WHEN and WHY questions. For the second task, a 'what' and a 'where' question was asked following the reading of each of four, three-line stories. This task will be referred to as WHAT and WHERE questions. More detail will be provided in the Procedure.

The training stories used in the Charlop-Christy et al. (2000) study were not available for this study although the stories created followed the same form (i.e., three line stories). In the Charlop-Christy et al. study the tasks were modelled in an exaggerated slow pace and the same stories were used for both tasks. In this study, the pace was normal (i.e., neither fast nor slow), and different stories were used for each task so that, when Jacob experienced the second task, the stories would not be more familiar to him. Although, the form of the stories for each task were similar (i.e. it was possible to ask each of the four questions in any story). In this study it was intended that the questions asked could not be answered without listening to the story. For instance, the questions asked did not have typical answers (e.g., Why did the boy go to hospital? Because he was sick). In this way it was possible to determine that the answers were in fact answers to the story content and not merely guesses.

For the first task in conversational reciprocity, Jacob was read 10 statements (e.g., "My friend's name is Carmel") and was required to reciprocate with "My friend's name is (name)." This task will be referred to as reciprocal statements. For the second task, Jacob was asked 10 questions (e.g., "How are you.") and was required to reply and then ask the author the same question. This task will be referred

to as reciprocal questions. More detail of the target behaviours and tasks is provided in Tasks, Videos and Models; and in the Procedure.

Apparatus

Video models were videotaped using a Sony Digital Video Camera Recorder (Handycam) (Model: DCR-DVD803E) placed on a tripod. Additionally, a Sony wireless microphone (Bluetooth®) (Model: ECM-HW1) was used to enhance volume. Picture Package software (Version 1.8) compatible with the aforementioned Sony Handycam and produced by Sony Corporation was used to transfer the Sony DVD to the computer hard drive so that editing could occur. Any videos requiring editing were edited using Microsoft® Windows® Movie Maker (Version 2.1 4026.0; Copyright© 1981-2001 Microsoft Corporation). All videos were played on a Toshiba Laptop (Model: MSAT01QAIV05) in Windows Media Player © 2006 Microsoft Corporation (Version 11.0.5721.5230).

Additionally, all sessions with participants were videotaped with the Sony Handycam placed on a tripod, so that the author could score correct and incorrect responses/behaviours from the videotapes. Additionally, a second observer was required to record data from the videotapes so that interobserver agreement of the dependent variable, and reliability of the independent variable for the interested/bored and good conversation tasks could be assessed.

Tasks, Videos, and Models

Each target behaviour was divided into two tasks. The two tasks were matched by the author in level of difficulty. As in the study by Charlop-Christy, et al. (2000), in baseline, each child's performance was comparable for each matched task.

Each of the two tasks were randomly assigned to either the wrong way/right way (wrong/right) or the right way/right way (right/right) video modelling treatment conditions by flipping a coin. Table 1 sets out the target behaviours, tasks, matching of tasks, and the assignment of tasks to the conditions for each participant.

The wrong/right treatment condition comprised one exemplar of a model completing the selected task the wrong way, and one exemplar of a model completing

Table 1

Target Behaviours, Tasks, Matching of Tasks, and Assignment of Tasks to the Conditions for each Participant

Participant	Target behaviour	Right/Right condition	Wrong/Right condition
Matthew	Conversation cue discrimination	Interested/bored - asked a question - answered a question - nodding and smiling - question not answered - no eye contact - rolled eyes	Good conversation - butted in - questions and comments - turn-taking - paused to let speak - question after question - monologue
Zac	Good conversation	Questions and comments Question after question Checked interest	Monologue Turn-taking Butted in
Jack	Manners	Correct response to coughing	Eye contact
	Interested/bored	Did not answer a question Asked a question No eye-contact and sighed	Answered a question Walked away Nodded and smiled
Paul	Interested/bored	Asked a question Sighed Eye contact	Nodded and smiled Walked away No eye contact
Frances	Turn-taking	Turn-taking choosing topics for the timetable Negotiating who will be teacher first Physically switching teacher roles	
	Good conversation	Butted in Monologue Questions and comments	Turn-taking Question after question Checked interest
Brian	Road safety	Road crossing - check for cars - identify oncoming car - hold hands and cross quickly	Ball retrieval - identify ball across road - get teacher to help cross road - stop before get to road
Jacob	Oral Comprehension	WHEN and WHY questions	WHAT and WHERE questions
	Conversational Reciprocity	Reciprocal statements	Reciprocal questions

the same task the right way. The right/right treatment condition comprised two different exemplars of a model completing the selected task the right way. For example, in the interested/bored videos, the author demonstrated both interested and bored behaviours (one cue at a time) which the model then identified correctly (right way) and incorrectly (wrong way). Hence, there were essentially four variations. The interested cues were correctly identified, and the bored cues were correctly identified (right way video); and the interested cues were incorrectly identified, and the bored cues were incorrectly identified (wrong way video).

In the wrong way videos, each model displayed a sample of the respective participant's current behaviour/responses which were incorrect and which video training was designed to modify. These incorrect responses/behaviours were derived from each participant's responses demonstrated in the baseline phase of the intervention. For Brian, the wrong way video exemplar was derived from a road safety instructional video (Environment Waikato Regional Council, n.d.).

Additionally, a coin flip determined the order of conditions, except for the tasks for Brian and Jacob. For Brian, one task logically preceded the other and was so ordered. For all participants apart from Jacob, the coin toss favoured wrong/right disproportionately in first position. Accordingly, for Jacob, right/right was ordered first for both target behaviours as it was desirable to determine whether order influenced responses in the second-ordered task.

For all but one of the interested/bored and good conversation target behaviours, the cues were divided equally between the two tasks. For ease of reference, the coin toss determined the naming of the task. That is, the task assigned to the first-ordered condition, as determined by the coin toss, will be referred to as interested/bored 1 and good conversation 1. Those assigned to the second-ordered condition will be referred to as interested/bored 2 and good conversation 2. Table 2 sets out the order of conditions resulting from the coin toss.

Once tasks had been assigned to either the wrong/right or the right/right conditions, modelling videos were made for each task. Apart from the turn-taking modelling video for Frances, each video showed the experimenter, and the model completing the tasks. The model demonstrated the behaviour the participant was to

Table 2

Order of Conditions for each Participant

Participant	Target behaviour	Right/Right	Wrong/Right
Matthew	Conversation cue discrimination	1	2
Zac	Good conversation	2	1
Jack	Manners	1	2
	Interested/bored	2	1
Paul	Interested/bored	2	1
Frances	Turn-taking	1	
	Good conversation	2	1
Brian	Road safety	2	1
Jacob	Oral comprehension	1	2
	Conversational reciprocity	1	2

imitate (and not to imitate for the wrong way exemplar). Model availability determined the models that could be used. All models were paid $10 each in the form of a voucher. Three models were obtained from a local amateur drama class. All other models had no acting experience. The models from the local amateur drama class did not outperform the other models. That is, their performances in the modelling videos were no better nor worse than the models who had no acting experience. All models were asked to act as naturally as possible and hence minimal rehearsal occurred. Generally, if any rehearsal was required, one rehearsal occurred. All models were children with normal development of the same sex. With the exception of two models, one of whom was of Chinese descent and one of whom was of European descent, all other models were of New Zealand European descent. Generally, the models were of similar age, unfamiliar to the participants, and the same models were used for both conditions (some exceptions are mentioned below).

Each participant watched his or her respective videos prior to testing for acquisition of the target behaviour(s). More detail will be provided in the Procedure.

Modelling Videos for Matthew

Interested/bored. For the interested/bored task (right/right), the models were 10 year old twin boys, and a 12 year old boy. The videos were made at the models' homes. The author and either of the twin models were facing each other while seated on the couch in the living room. The 12 year old model and the author faced each other while sitting on the floor in the corner of the living room.

The model talked about different topics (e.g., cats) and the author displayed an interested cue (e.g., nodding and smiling) or a bored cue (e.g., looking away). The author asked the model whether the author was interested in or bored with his conversation and why. The model answered "You were interested (or bored) because you were nodding and smiling at me (or looking away)." The author replied "You're right." That is, for all six cues the model correctly identified the cue. The correct identification of the cue was confirmed/determined by the author's reply (i.e., "You're right"). Two videos were made, each demonstrating the six interested and bored cues (right/right) in the same way as described above, however different conversations occurred for each of the cues in each of the two videos. That is, each

video displayed six different conversations with one cue being displayed per conversation. Each of the two videos was approximately 2 min 15 sec in length.

The interested and bored cues were derived from cues used in an instructional video (Murdock & Khalsa, 2003). It became apparent following the first video presentations to Matthew in the treatment condition that he was friends with the twin models, one of whom was in his class. This was co-incidental and an unintended consequence. The models did not know Matthew had a diagnosis and hence the situation was sensitive. Therefore, different models were required to be used for the second task.

Good conversation. For the good conversation task (wrong/right), a 9 year old boy and a 10 year old boy acted as models. The author and either of the models, were facing each other while, either sitting on the floor, or sitting in chairs turned slightly towards each other. The author and model had a short conversation, and the author influenced the course of the conversation so that it was largely dominated by one cue (e.g., talking in monologue fashion). At the end of the conversation the author asked the model whether the conversation was a good one or not, and why.

For the wrong way video, six short conversations occurred, each conversation largely dominated by a different cue. For all six cues, the model answered incorrectly (e.g., “It wasn’t because you kept saying and”). The author responded with “That’s not right.” That is, the model did not correctly identify the cue for any of the six cues. The incorrect identification of the cue was confirmed/determined by the author’s reply (i.e., “That’s not right”).

For the right way video, for all six cues, the model answered correctly (e.g., “No, because you talked and talked and wouldn’t let me talk”). The author responded with “You’re right.” That is, the model correctly identified the cue for all six cues contained in the six conversations (one per conversation). The correct identification of the cue was confirmed/determined by the author’s reply (i.e., “You’re right”). Each of the two videos was approximately 3 min in length.

The cues were derived from an instructional video demonstrating conversational mistakes (Murdock & Khalsa, 2003).

Modelling Videos for Zac

The models for Zac were a 12 year old boy and a 15 year old boy. Each model acted in both sets of videos. For both tasks in the good conversation target behaviour, the author and either of the two models sat in armchairs in the author's living room, with each armchair turned slightly towards the other. Short conversations took place which followed the form as described for Matthew in the good conversation task but three mixed cues (i.e., good and bad) were assigned to the wrong/right video modelling treatment condition and three mixed cues (i.e., good and bad) were assigned to the right/right treatment condition. All cues were derived from the instructional video as previously described for Matthew.

Good conversation 1. For good conversation 1 (wrong/right) two videos were made for each of the three cues assigned to the task. One video demonstrated incorrect answers (i.e., the cues were not correctly identified) and the author responded "That's not right;" and one video demonstrated correct answers (i.e., the cues were correctly identified) and the author responded "You're right." Each of the two videos was approximately 1 min 45 sec in length.

Good conversation 2. For good conversation 2 (right/right) two videos were made demonstrating correct answers (i.e., the cues were correctly identified) for each of the three cues assigned to the task with the author responding "You're right." Each video contained different conversations. Each of the two videos was approximately 1 min 25 sec in length.

Modelling Videos for Jack

Manners. A 15 year old boy acted as the model in both tasks for the manners target behaviour. For the correct response to coughing task (right/right) both exemplars of the videos opened the same way. That is, the model stood in the author's living room. In one video exemplar the author approached the model and began a conversation. Shortly thereafter the author began coughing displaying eight discrete coughs. The model responded with "Are you okay. Can I get you anything." The author replied in the negative and thanked the model for asking. In the second video exemplar the author coughed 12 times in the vicinity of the model. The model asked "Are you alright. Can I get you a drink of water." The author replied in the

affirmative and after drinking the water, thanked the model. Hence, both video exemplars closed the same way, with the author thanking the model. Each video was approximately 18 sec in length.

For the eye-contact task (wrong/right), each video was approximately 12 sec in length and both video exemplars began the same way. That is, with the model in an off-body position to the author in the living room of his house. In both video exemplars, the author approached, greeted, and asked the model about his day at school. In the wrong way video exemplar the model did not turn his body toward the author or make eye contact but replied (in the off-body position) and then asked the author about her day. The author looked puzzled, scratched her head, did not reply and walked away. In the right way video the model turned his body toward the author and made eye contact when she greeted him. The model replied to the author's question and asked the author about her day. She replied smiling. Hence, in the wrong way video the author did not reply, but in the right way video the author replied smiling (a positive social consequence).

Interested/bored. For the interested/bored target behaviour, Jack's brother, and his caregiver, both in their early twenties and both reported by Jack's parents to be well liked by Jack, acted as models for both tasks. The interested and bored cues were derived from the same instructional video as for Matthew. Jack's brother and the author sat facing each other on chairs in the basement at Jack's home. Jack's caregiver and the author sat on the couch facing each other in the caregiver's living room. The form for this target behaviour is as for the interested/bored task for Matthew but for Jack, three mixed cues (i.e., interested and bored) were assigned to the wrong/right treatment condition, and three mixed cues were assigned to the right/right video treatment condition.

For interested/bored 1 (wrong/right) one set of cues, each embedded in a different conversation, was modelled with incorrect answers (i.e., cues incorrectly identified) and the author responded with "That's not right" so that the model's response was identified as a wrong response (wrong way). A second set of cues, each embedded in a different conversation, was modelled with correct answers (i.e., cues were correctly identified) and the author responded with "You're right" so that the right way could be clearly identified by the participant (right way). Each of the two

videos was approximately 1 min 25 sec in length. For interested/bored 2 (right/right) two sets of the same cues were modelled but in different conversations with correct answers (i.e., both sets of cues were correctly identified) and the author responded with "You're right." Jack did not view these videos because prior to the inception of the video modelling treatment for this task, Jack refused to watch any more videos.

Modelling Videos for Paul

For the interested/bored target behaviour, a 15 year old boy acted as the model for both tasks. The model and the author sat in armchairs in the author's house, each armchair was turned slightly towards the other. Cues were derived from the same instructional video as for Matthew. The videos followed the script as described for the same target behaviour for Jack. Each of the four videos was approximately 50 sec in length.

Modelling Videos for Frances

Turn-taking. For the turn-taking target behaviour (right/right), a 12 year old girl acted as the model. Frances' mother suggested an older model may exert more influence on Frances' behaviour given that Frances was serious in nature. A female in her early twenties acted as the model's play partner for turn-taking in a "lets play schools" setting. A pencil, rubber, ruler, and paper were used. Both sat at a table in the dining room of the model's home. There were three behaviour targets: taking turns deciding what would go on the timetable, negotiating who would be teacher first, and physically taking turns at being teacher.

One video demonstrated the model asking to play schools, both the model and play partner taking turns choosing subjects for the timetable, and commenting that they were having fun. In the second video, the model and play partner negotiated who would be teacher first, did maths, switched teacher roles, and did silent reading, while smiling and appearing to have fun. Each of the two videos was approximately 50 sec in length.

During the video modelling treatment, Frances complained to her mother that the models were 'babyish.' Model characteristics are considered important in any modelling treatment. It has been suggested that one of the pivotal factors in

successful imitation may be an observer's ability to identify with the model (Dowrick, 1991). As models who are not liked by a participant may have a negative impact on whether the observer will imitate the model's behaviour, impacting negatively on the intervention, new videos with other models were made. For the replacement videos, a 10 year old girl acted as the model, and the author as the model's play partner. A whiteboard, whiteboard marker, whiteboard eraser, exercise book, pencil, rubber and ruler were used. The videos were made in the living room of the model's home with the model and author sitting on chairs. Each video demonstrated the same turn-taking targets (i.e., taking turns deciding what would go on the timetable, negotiating who would be teacher, doing a task, switching roles, and completing another task) while commenting that the play was fun and turn-taking was the fair way to play. In one video the tasks were spelling and sport, while in the other the tasks were maths and silent reading. Each of the two videos was approximately 1 min 40 sec in length.

Turn-taking was selected by the parents as the most important behaviour for acquisition for Frances. Finding a matched task for the wrong/right condition was not possible because of time restraints and limited resources.

Good conversation. For the good conversation target behaviour, another 10 year old girl acted as the model for both tasks. The author and the model sat in chairs in a room facing each other. The form of these videos followed that as described for Zac and the cues were derived from the same instructional video described previously. Each of the four videos was approximately 1 min 40 sec in length.

Modelling Videos for Brian

For the road safety target behaviour, the model was 7 years older than Brian but, like the author, his voice and hands only (manipulating a toy doll) were present in the videos. A play mat of a road was used which displayed a two lane road and two park areas. One park area was used for the school ground where blocks representing a school, three toy trees, and a female adult doll representing a teacher were placed along with a ball. A toy doll of a boy represented Brian, and a toy doll of a girl represented Brian's play partner. Additionally, there were two toy cars and a

school bus placed on the road on the play mat. For both tasks the model and the author were positioned on either side of the play mat in the author's lounge.

The scripts for both tasks were derived from videos in which Ruben, the road safety bear© teaches road safety skills. Ruben the road safety bear, a road safety icon, visits schools and pre-schools in the local region teaching children about road safety (Environment Waikato Regional Council, n.d.).

Ball retrieval. For the first task, ball retrieval, the model and author (as play partner) played ball (wrong/right). The three behaviour targets represented in the videos were verbalising what happened when the ball went across the road, approaching the teacher and asking for help, and stopping on the footpath in front of the road (right way). The wrong way video depicts the model (doll) running onto the road to retrieve the ball. The author responds with, "That's the wrong way to cross the road and get the ball." Because of the ethical considerations previously mentioned, care was taken to make the wrong way video as closely as possible to a demonstration of the wrong way to retrieve a ball (running on the road) shown in the road safety video previously mentioned. Scripts of these videos are included in Appendix G. Both videos total approximately 45 sec in length.

Road crossing. For the second task, road crossing (right/right), the three behaviour targets the model demonstrated were checking for cars, looking both ways to discriminate if cars were coming and crossing the road safely (i.e., "Lets link hands and cross quickly"). Again, the script for road crossing for this video bears a close resemblance to the information provided in the road safety video previously mentioned. Scripts giving details of the various responses for these videos are included in Appendix H. Both videos total approximately 45 sec in length.

Modelling Videos for Jacob

Oral comprehension. For both tasks in the oral comprehension target behaviour, the model was a 10 year old boy of Chinese descent. The author and model sat at a dining table, at right angles to each other, in the dining room of the model's home. In the first task, WHEN and WHY questions (right/right), the author read a story and then asked one 'when' question and one 'why' question. The model answered correctly. The author responds with "You're right" to signal the right way

video. In the same way, a further three stories are read, questions are asked and answered, and the same feedback given. Two video exemplars are made using the same stories. In the second video exemplar, the model's answers are slightly different (i.e., different words are used). The training stories and questions are provided in Appendix I. Each of the two video exemplars is approximately 2 min 10 sec in length.

In the second task, WHAT and WHERE questions (wrong/right), the form of task is the same as for WHEN and WHY questions except one video exemplar of the model responding correctly is shown (right way), and one video exemplar of the model responding incorrectly is shown (wrong way). In the right way video, the author responds with "You're right" to signal the right way video, and in the wrong way video, the author responds with "That's not right" to signal the wrong way video. The training stories and questions are provided in Appendix J. Each of the two videos is approximately 2 min 10 sec in length.

Conversation reciprocity. For the conversational reciprocity target behaviour, the same 10 year old model as was used for the oral comprehension target behaviour, and two 10 year old twin boys acted as models in each of the tasks. It was necessary to use at least two models as different replies could not be modelled using one model. That is, one model replying that his favourite animal was a giraffe in the first video and that it was a cat in the second video would have reduced the credibility of the videos. In all videos, each model and the author sat at the dining room table, at right angles to each other, in the respective models' homes.

In the first task, reciprocal statements (right/right), the author read a statement (e.g., My favourite animal is a giraffe). The model replied, "My favourite animal is a (name)" and the author responded with "Nice reply" or similar to signal the right way video. Ten statements were read and replied to in the same way. In one video exemplar the 10 year old Chinese model replied to all statements. In the other video exemplar the 10 year old twins replied to five statements each. The list of statements is provided in Appendix K. The content of the statements were derived from material provided in the Autism Partnership Curriculum for Discrete Trial Teaching with Autistic Children (Leaf & McEachin, 1999). Each of the two right way video exemplars was approximately 1 min in length.

For the second task, reciprocal questions (wrong/right), the author asked a question (e.g., Do you have any sisters?), the model answered and was required to ask the author the same question. In the wrong way video, for all 10 questions, the model answered the question but did not reciprocate with the same question. The author responded with "You didn't ask me back" to signal the wrong way video. The 10 year old Chinese model answered five questions, while the 10 year old twins answered three questions and two questions respectively.

In the right way video, for all 10 questions asked by the author, the model answered and asked the author the same question. The author answered saying "Nice asking" or similar to signal the right way video. The 10 year old Chinese model answered five questions, while the 10 year old twins answered two questions and three questions respectively. The list of questions is provided in Appendix L. The content for the questions were derived from material provided in the Autism Partnership Curriculum previously mentioned and material provided in Goals to Grow, the ABA Way (Johnston, Napiorski, & Yanazzo, 2006). Each of the two videos was approximately 1 min 10 sec long.

Settings

The settings for the study were either a room at the participant's home or a room at the participant's school. The parents were given a choice of setting. Both settings were offered because a home setting for all participants was impractical given the children were of school age and there was a limited time frame between school and the evening meal which would have made it impossible to see a number of participants each day.

Matthew

Baseline, training and maintenance sessions for conversational cue discrimination were conducted at Matthew's school in an unused classroom four times weekly. It contained tables and chairs, a projector, a whiteboard, and cupboards. On four occasions when the room was being used, baseline and training sessions were conducted in the annex between the unused classroom and another classroom. The annex was approximately one-sixth the size of the unused room and

contained a table and two chairs, two tables for the display of library books and a mirrored door to a resource room. Generalisation probes were carried out while Matthew was playing on the play equipment in the playground. It was considered that using the play equipment while completing the task was an added distraction and may have reflected situations Matthew would encounter with peers (i.e., playing and talking while being required to discriminate cues). The play equipment comprised several climbing frames in a covered area with bark chips covering the ground.

Frances

Baseline, training and maintenance sessions for turn-taking and good conversation were conducted at Frances' school in the reading room three to four times weekly. The reading room contained a free-standing whiteboard, three tables with two chairs, and shelves displaying books. Generalisation probes were carried out while Frances was playing on the play equipment in the playground. Hence, added distractions were present. Play equipment comprised several climbing frames and a flying fox.

Paul

Baseline, training, and maintenance sessions for the interested/bored target behaviour were carried out in the office attached to Paul's classroom two to three times weekly. The office contained two, two-seater couches, desks, chairs and shelves containing files and educational resources. Generalisation probes were conducted outside Paul's classroom in the lunch area, but not during lunch. The lunch area comprised a concreted area with two wooden tables with benches attached, seating approximately six people.

Jack

Baseline, training, and maintenance sessions for manners and the interested/bored target behaviours were conducted in the living room at Jack's house three times weekly. The living room was adjoined to the dining room making an 'L' shape. The front door was part of the living room. The living room comprised two leather couches, a coffee table, a wood burner and various cabinets. In some

sessions, one or two members of Jack's family were situated in the dining room while sessions were being conducted in the living room. Generalisation probes were carried out in the dining room at Jack's house. The dining room contained a large rectangular table with six chairs. Midway through the intervention furniture in the living room was rearranged by Jack's family.

Zac

Baseline, training, and maintenance sessions for good conversation were conducted in the dining room at Zac's house three times weekly. The dining room was adjoined to the kitchen area but divided by cupboards and a bench. The dining room comprised a table with five chairs. In most sessions, Zac's mother was working in the kitchen while sessions were conducted. Generalisation probes were conducted while walking in a nearby park. Thus, the added distraction of walking while talking was present in the generalisation setting.

Brian

Baseline, training, and maintenance sessions for road safety were conducted in the living room at Brian's house initially twice weekly, and increasing to three days weekly in the last three weeks of the intervention. The living room comprised two leather couches, a television, shelving, a coffee table, a rug, and various toys were present on the floor. Generalisation probes were conducted outside on the driveway.

Jacob

Baseline, training, and maintenance sessions were conducted in the dining room at Jacob's house three times weekly. The dining room comprised a rectangular table with bench seating along one side and chairs along the other. The dining room adjoined the kitchen, and the living room but was separated from the living room by a couch and additional bench seating. In most sessions Brian's father was present in either the kitchen or living room when sessions were conducted. Generalisation probes were conducted in the living room. The living room comprised a large television, speakers, two couches, a large rug, a fish tank, with various toys present

on the floor. Midway through the intervention furniture in both the dining room and living room were rearranged by Jacob's family.

Procedure

A multiple baseline design across children; within child across the two modelling conditions; and within each modelling condition across the two tasks was used (Charlop-Christy et al., 2000). Unlike the Charlop-Christy et al. (2000) study, baseline probes were taken (Horner & Baer, 1978). Two children, matched in age where possible, were assigned to each multiple baseline (Barlow & Hersen, 1984). Tasks were counter-balanced. That is, if both tasks were tested on the same day, the order of the tasks experienced by the participants was alternated for every succeeding session to counter order effects.

The author of the current study served as the experimenter. For three of the participants (Brian, Jack, and Jacob) other people (therapist, brother, and father respectively) served as one of the experimenters for the baseline generalisation and generalisation probes. All parents were instructed not to practise the tasks with their children at home, help with the answers, or reinforce the target behaviours. This instruction was given to ensure experimental control. That is, to ensure that the video modelling treatment was responsible for any behaviour change, rather than other variables (including reinforcement).

For the interested/bored and good conversation target behaviours/tasks, for all sessions (e.g., baseline, training), lists of topics were provided to the participants, if needed, to aid in topic selection. Additional lists were provided when participants had difficulty choosing a topic from the existing lists (i.e., most topics on lists had been talked about, or the participant did not want to talk about them). Copies of these lists are provided in Appendices M1-M6. One of the participants, Zac, contributed to the list provided in M4.

Prompting was not used during the baseline, generalisation and maintenance phases of the intervention. Additionally, reinforcement was not used during the baseline phase of the intervention. During the video modelling treatment, prompts

were delivered, if necessary, to keep the participants on-task (e.g., “look at the video”, “almost finished”).

In the task-type modelling (i.e., the manners, turn-taking, and road safety target behaviours), praise for on-task behaviour was delivered, and any consequences delivered to the model (i.e., social praise) in the video were delivered to the participants in the video modelling treatment, generalisation and maintenance probes. For example, if Jack responded to coughing in the manner shown on the videos, then the experimenter thanked him as she did the video model in the modelling videos. That is, the natural maintaining contingencies (Stokes & Baer, 1977) built into the videos were reproduced in training.

In the conversation-type modelling, for Matthew, Frances, and Jack, for the interested/bored and good conversation tasks verbal praise was delivered for attending to the video, being patient, working hard, and completing the task. Initially these participants did not receive the feedback that was delivered to the models shown in the video (i.e., “You’re right,” “That’s not right”). The reason the feedback was included in the modelling videos was to differentiate the right/right and wrong/right modelling treatment conditions. Feedback was not made available to these participants as “You’re right” may have acted as a reinforcer (as previously mentioned in the introduction herein) and it was intended to separate the video modelling component from reinforcement so that any treatment effects could be attributed to the video modelling treatment only. However, later the feedback delivered to the models in the video was delivered to these participants. This first group of participants frequently complained that the models received feedback in the form of “You’re right” or “That’s not right,” but they did not. It seemed that this first set of participants were well used to feedback (all placed in regular classrooms), and because the lack of feedback, if reinforcing, was effectively extinction, results may have been contaminated which was undesirable. Therefore, the same feedback the models received (i.e., “You’re right,” “That’s not right”) was later delivered to Matthew, Jack, and Frances. More particularly, in the 12th treatment session for Matthew (conversation cue discrimination), in the fifth treatment session for Jack (interested/bored), and in the eighth treatment session for Frances (good conversation). That is, for each task, in each respective condition, feedback was

added at the same point (e.g., the eighth video modelling treatment session for good conversation 1 and the eighth video modelling treatment session for good conversation 2). For all other participants, this feedback was delivered from the beginning of the video modelling treatment.

For the conversation-type modelling (i.e., conversation cue discrimination, good conversation, interested/bored, oral comprehension, conversational reciprocity) the questions/statements, cues, stories were presented in random order across all phases (e.g., baseline, video modelling treatment) of the intervention.

Baseline

Prior to baseline, a test session was conducted with each child to assess whether the pre-determined training tasks were suitable for training. Only tasks showing low levels of correct responding were selected to be trained. Prompting and reinforcement were not provided in the test session. During baseline neither prompting nor reinforcement was provided for correct responses. The video modelling treatment began following three stable baseline responses, or if unstable, when baseline responses were stable. Additionally, two stable baseline generalisation probes were required. The second baseline generalisation probe was experienced by the participants just before the video modelling treatment began to ensure that generalisation had not occurred (Horner & Baer, 1978).

Video Modelling Treatment Sessions

The video modelling treatment took place in the training setting. The child was asked to sit and watch the laptop computer screen. The experimenter sat next to the child to ensure that the child was attending to the computer screen. Prompts, if necessary, were given to ensure that the child watched the videos. Praise was delivered for looking at the videos.

The procedure for video viewing followed the procedure described by Charlop-Christy et al. (2000) approximately. That is, the participants initially viewed the videos twice before testing began. The experimenter said “We’re going to do the same as in the video” for all participants (except for Jack) and commenced the task. In the case of Jack who was 15 years old, in the manners task, a judgement was made

that such an instruction would be regarded as trivial by Jack and so was omitted. Instead, an opportunity to imitate the video was given to Jack soon after viewing. If a participant did not reach criterion for two sessions, the video was presented again (once) and testing occurred immediately after (Charlop-Christy et al., 2000).

For the conversation cue discrimination, interested/bored, good conversation, oral comprehension, and conversational reciprocity target behaviours/tasks (i.e., conversational-type modelling), this procedure was repeated until either, criterion (100% correct responding for two consecutive sessions without video presentations) was met; responding stabilised; or the same number of opportunities to reach criterion had been presented for the second task as for the first. If a participant scored 100% correct in the session prior to a scheduled video presentation session, the video presentation did not occur. This gave a participant a second opportunity to score 100% correct and thereby reach criterion.

For the manners, turn-taking and road safety target behaviours (i.e., task-type modelling), if the participant did not reach criterion (all behaviour targets achieved for two consecutive sessions without video presentation) after four (including the initial two) video presentations, narration by the author was added in the form of a video introduction. For Frances, the introduction was presented following four video presentations of the new (remade with different model) videos. Narration was not provided from the beginning of the video modelling treatment because it was desired to separate components and narration may have been considered an instruction, and thus any increase in behaviour targets may not have been solely attributed to the modelling treatment. It was therefore desirable to ascertain whether the participants could achieve criterion without this verbal description/instruction. In the video introductions the experimenter is seen talking about the target behaviour and probable consequences (e.g., “Taking turns is the fair way to play … When friends get a turn, they will most likely want to play again”). The video introductions for the manners target behaviour for Jack are provided in Appendix N. The video introduction for the turn-taking target behaviour for Frances is provided in Appendix O. The video introductions for the road safety target behaviour for Brian are provided in Appendix P. Except for Frances, the video introduction (narration) was viewed by the participants whenever a video presentation was scheduled for the next three video

presentations. Frances viewed the introduction twice as play in the turn-taking task had deviated significantly from the play shown in the videos, and thus training ended. For the correct response to coughing task in the manners target behaviour, Jack received a fourth presentation of the video introduction and videos and was asked to do exactly what he saw in the video. That is, for Jack, the instruction "Let's do the same" was originally omitted because, given his age, it was considered he may think it trivial. However, a final video presentation was scheduled to determine whether Jack would imitate the video if the instruction the other participants received was delivered to him (i.e., "Let's do the same"). Following three presentations of the video introduction, if criterion was not reached the participant was asked to describe what they saw in the videos. If the participants were able to describe the videos correctly, they were asked why they did not emit the target behaviour. Training then ended. Table 3 sets out the different procedures for the task-type and conversational-type modelling.

The modelling videos were presented in the following order. In the wrong/right video modelling treatment, the wrong way exemplar was presented first, followed by the right way exemplar. The order was reversed for the next presentation, and reversed again for each successive presentation. That is, the order was alternated every presentation. In the same way, for the right/right video modelling treatment, the order of presentation was alternated every presentation to avoid order effects.

Generalisation Probes

Generalisation probes across people depended on the availability of family members in the home settings. Other people were not available to the experimenter in the school settings. Generalisation probes across settings, and for Jack and Brian additionally across persons, and for Jacob additionally across persons and stimuli, were conducted during baseline probes, and approximately 7 days after criterion was met in training. For Jack (withdrawal from the study), and Brian (criterion was not reached) no generalisation probes were conducted. Feedback (potential reinforcer) was provided for correct responses. Despite, that feedback was delivered and Cuvo (2003) considers that generalisation must be tested under extinction conditions, he

Table 3

Procedures for Task-type and Conversational-type Modelling

Modelling	
Task-type	Conversational-type
• Manners • Turn-taking • Road safety	• Interested/bored • Good conversation • Oral comprehension • Conversational reciprocity
1. Initially two video presentations	1. Initially two video presentations
2. Two opportunities to reach criterion, if no criterion	2. Two opportunities to reach criterion, if no criterion
3. One video presentation	3. One video presentation
4. Two opportunities to reach criterion, if no criterion	4. Two opportunities to reach criterion, if no criterion
5. Repeat steps 3 and 4 once, if no criterion	5. Repeat steps 3 and 4 until either criterion reached, responding stabilised or same number of opportunities to reach criterion as for first task
6. Introduce video introduction (narration) immediately prior to video presentation	6. Training ends
7. Repeat step 4 and 6 twice	
8. Description	
9. Training ends	

Note. If a participant scored 100% correct in the video modelling treatment session prior to a session where a video presentation was scheduled, a video presentation did not occur and a second opportunity to reach 100% (i.e., criterion) was provided.

concedes that Stokes and Baer (1977) allowed that generalisation could occur when some forms of intervention are used (i.e., feedback) but less than was used to produce results under training conditions. No video presentations occurred during generalisation probes and thus for this study generalisation conditions were considered acceptable. Further, feedback was delivered because of the complaints received initially during the video modelling treatment for Matthew, Jack, and Frances when feedback was not delivered for responses. That is, it was considered that withdrawal of feedback during the generalisation probes may have reproduced complaints which had the potential to contaminate results. A maximum of three probes were taken, reduced to two if the participant responded with 100% accuracy in the first two probes.

Maintenance Probes

Generally, one maintenance probe was taken in the training setting approximately one month following completion of training for all participants. For Jacob, maintenance probes were conducted 6 weeks after criterion was reached and three probes were taken for the oral comprehension target behaviour, as in the maintenance probes only, questions were asked in random order. That is, some questions were asked in the same order and some were asked in reverse order. One final maintenance probe for the oral comprehension task was completed between 7 and 8 weeks after criterion was reached, and in this maintenance probe questions were not asked in random order. This occurred so that it could be determined whether Jacob had memorised the answers to the questions.

Maintenance probes were not conducted for Brian as training was modified and continued following the end of training. A maintenance probe was not conducted for Frances in the turn-taking target behaviour because in the last sessions of the video modelling treatment the form of play had changed substantially. That is, play had previously followed the form shown in the modelling videos. Hence, it was not considered worthwhile to complete a maintenance probe. Maintenance probes could not be completed for Jack because he withdrew from the intervention. Thus, maintenance probes were completed for the conversation-type modelling only and

feedback (e.g., “You’re right,” “That’s not right”) was delivered for responses. No video presentations were made in the maintenance probes.

Target Behaviours

For each task in each target behaviour, instructions to participants, task descriptions, data collection and dependent variables are detailed below.

Matthew

Interested/bored. For the first task, interested/bored, Matthew was to correctly determine whether the experimenter (listener) was interested in or bored with his conversation and label the interested or bored cue correctly (right/right). The experimenter instructed the participant to talk about anything (and instructed that he could ask questions) and then determine whether the experimenter was interested or bored, and why. If the participant did not know he was instructed to say he did not know. While the participant was talking the experimenter displayed one of the cues. The number of interested and bored cues were equal (i.e., three each). The interested cues were asking a question, nodding and smiling, and answering a question. The bored cues were rolling eyes, not making eye contact, and not answering a question. Occasionally, prompts were delivered to Matthew to remind him to ask a question so that the experimenter could display the ‘answered a question’ and ‘didn’t answer a question’ cues.

Good conversation. For the second task, Matthew was to correctly determine whether the conversation between the experimenter and himself was a good one or not and label the good or bad conversation cue correctly (wrong/right). The experimenter instructed that she and the participant were going to have short conversations and at the end of each one the participant was to determine whether the conversation was a good one or not and what made it good or bad. If the participant did not know he was instructed to say he did not know. The experimenter influenced the course of the conversation so that the conversation was largely dominated by the presence of one of the cues. Occasionally, a conversation failed because the conversation was not largely dominated by one cue. The good conversation cues were turn-taking, pausing to let the other speak, and both participant and

experimenter asking questions and making comments. The bad conversation cues were talking in monologue fashion, asking question after question, and butting in.

For both tasks, the cues were presented in random order. Criterion was reached when the participant identified all cues with 100% accuracy over two consecutive sessions without presentation of the modelling videos. For both tasks, the same cues were used for the generalisation probes which were conducted in a new setting (while playing on play equipment in playground).

Data collection and dependent variable. On a data form the experimenter recorded the date, the phase (i.e., baseline, baseline generalisation, video modelling treatment, generalisation, maintenance), the occurrence of video presentations, the order of video presentation, the order tasks were presented, and the number of cues correctly identified. Additionally, the data form contained five columns. In the first column, the experimenter numbered the order of cues presented; in the second column, the cue to be presented was stated; in the third column the experimenter recorded the participant's response as interested, bored or don't know (or no, yes or don't know for good conversation); in the fourth column, the experimenter recorded the participant's reason (i.e., identification of the cue); and finally, in the fifth column, the experimenter scored the response as correct or incorrect. The third and fourth columns needed to correspond. That is, the reason (e.g., you were nodding and smiling) needed to agree with 'interested' to be scored correct. The reasons given by the video models in the right way videos were accepted as correct as was any paraphrase of the models responses which led to the correct identification of the cue. If the cue contained two components (e.g., nodding and smiling), both components were required to be stated by the participant to be scored correct.

Zac

Good Conversation. As for Matthew, for both tasks, Zac was to determine whether the conversation between the experimenter and himself was a good one or not and label the presented cue correctly. Two bad conversation cues (butting in, talking in monologue fashion) and one good conversation cue (taking turns talking) were presented in the wrong/right video modelling treatment condition; and two good conversation cues (both asked questions and made comments, talked about what I

was interested in) and one bad conversation cue (question after question) were presented in the right/right video modelling treatment condition. Both sets of cues were presented in random order. Instructions, procedure, criterion and generalisation probes (while walking in a nearby park) followed that described for Matthew.

Data collection and dependent variable. As described for Matthew.

Jack

Manners. For the first task, Jack was to respond with "Are you okay. Can I get you anything", or "Are you okay. Can I get you a drink of water" in response to the experimenter coughing an average of eight times (right/right). The first behaviour target was "Are you okay." The second behaviour target was either "Can I get you anything", or "Can I get you a drink of water."

For the second task, Jack was to turn his body and make eye-contact when the experimenter asked him "How was school today" (wrong/right). "How was your day today" or similar was substituted in holiday periods when data was collected. The first behaviour target was achieved when Jack turned his body towards the experimenter. The second behaviour target was achieved when Jack made eye-contact with the experimenter for a minimum period of 2 sec.

Criterion was met for each task when both behaviour targets were achieved across two sessions without video presentation. For both tasks generalisation probes were conducted with a new person (brother). Baseline generalisation probes were completed but generalisation probes and maintenance probes were not conducted following training because Jack refused to watch the videos (i.e., withdrawal occurred).

Data collection and dependent variable. For both tasks, the experimenter recorded the date, phase (e.g., baseline, baseline generalisation, video modelling treatment), the occurrence of video presentations and the order of presentation, a tick (achieved) or cross (not achieved) was recorded for each behaviour target, the actual behaviour displayed by the participant was recorded, and any verbal behaviour was recorded following the discriminative stimulus (i.e., "How was school today" for the eye-contact task; or the experimenter coughing in the correct response to coughing task).

In the correct response to coughing task, any paraphrase of the target phrases were accepted as correct. In the eye-contact task, the target was achieved if Jack moved his body in the direction of the experimenter. That is, if Jack's body position was slightly off the direct face to face body posture shown by the video model the body posture target was scored as achieved. Eye-contact was achieved if Jack looked at the experimenter's face for a period of at least 2 sec.

Interested/bored. For both tasks, Jack was to correctly determine whether the experimenter (listener) was interested or bored and label the presented interested or bored cue correctly. Two interested cues (answered question, nodded and smiled) and one bored cue (walked away) were assigned to the first task (wrong/right). Two bored cues (no eye contact and sighed, and didn't answer a question), and one interested cue (asked a question) were assigned to the second task (right/right). Instructions, procedure, criterion, and generalisation probes (in dining room) followed that set for Matthew. A prompt directing that Jack not ask questions was required to be delivered because he generally asked questions in every conversation which interfered with the target cue the experimenter was attempting to display and caused conversations to fail.

Data collection and dependent variable. As described for Matthew.

Modification of interested/bored target behaviour. Jack refused to watch the videos in the fifth video treatment session, so following this session the interested/bored target behaviour was modified to an error and correction task with delivery of a tangible reinforcer. That is, when Jack identified the cue correctly, praise and a 50 cent coin were delivered. If Jack identified the cue incorrectly, the experimenter advised Jack he was incorrect and advised the correct cue. Jack's mother advised that delivering 50 cents would be reinforcing to Jack and further that she found previously when teaching Jack other skills, that when Jack recorded a tick (for correct responses) or a cross (for incorrect responses) his learning increased. The modified instructions delivered to Jack by the experimenter were "From now on you can earn 50 cents for each correct answer you give. Give yourself a tick or a cross for your answer."

Dependent variable. For the modified task, any description of the behaviour that the experimenter displayed in the target cue was scored as correct (including

"because you were going like this with your head (demonstrated nodding) and you were smiling").

Additional tasks. Additional tasks (e.g., Who wants to be a Millionaire, Fact or Opinion, Nice or Mean, What am I) were introduced for Jack because he complained about the lack of feedback in the baseline phases for the interested/bored target behaviour. The task, 'Who wants to be a millionaire' was modelled on the TV series known by the same name. The author asked a question (e.g., Which planet is closest to the sun?) and gave four multiple choice answers. Jack was required to choose one answer and following his response was advised if it was correct or not.

For the task, 'Fact or Opinion' the experimenter made a statement which was either a fact (e.g., "It's raining outside") or an opinion (e.g., "I think summer is great") and asked Jack whether the statement was a fact or opinion. Following his response, Jack was advised if he was correct or not. The content for this task was derived from a language manual (Freeman & Dake, 1996).

For the task, 'Nice or Mean' the experimenter either made a nice statement (e.g., "I like your shirt") or a mean statement (e.g., "Tommy is terrible at sports") and asked Jack whether the statement was nice or mean. Following his response, Jack was immediately advised if his answer was correct or not. The content for this task was derived from an instructional video (Murdock & Khalsa, 2003).

The task 'What am I' comprised a pack of cards with three clues on each card. For example, "I have a handle, I can open and close, you use me when it rains. What am I?" (Prince, 2004). The experimenter and Jack each had an equal number of cards and the experimenter recorded correct answers. Following each of Jack's responses, the experimenter advised him whether he was correct or not. At the end of the task scores were summarised (e.g., "You got (number) right. I got (number) right").

These additional tasks were designed to increase reinforcement delivered to Jack throughout the sessions to maintain participation in the training tasks. The additional tasks did not comprise social skills that interfered with the training tasks and praise was delivered for correct responses.

Paul

Interested/bored. For both tasks, Paul was to correctly determine whether the experimenter (listener) was interested or bored and label the presented interested or bored cue correctly. For the first task, two bored cues (walked away and no eye-contact) and one interested cue (nodded and smiled) was assigned to the wrong/right video modelling condition. For the second task, two interested cues (asked a question, and eye-contact), and one bored cue (sighed) were assigned to the right/right video modelling treatment condition. Instructions (except that no instruction was given to ask questions), procedure, criterion and generalisation probes (outside in lunch area) followed that set for Matthew.

Data collection and dependent variable. As described for Matthew.

Frances

Turn-taking. There was only one task for this target behaviour (right/right). The participant was instructed to play schools with the experimenter for a period of 7 min. A whiteboard, exercise book, pencil, rubber, and ruler were made available for use (same materials as were used in the modelling video). The participant was instructed "Pretend I'm a friend coming over to play schools. Do you want to play schools?" The participant was required to take turns with the experimenter in creating the timetable, negotiating who would be teacher first, and take turns being the teacher (i.e., swap over). Criterion was reached when all three behaviour targets were achieved for two consecutive sessions without video presentations. Generalisation probes were conducted with new stimuli (i.e., the participant was instructed to play doctors). As already mentioned, no maintenance probe was conducted.

Data collection and dependent variable. The experimenter recorded the date, phase (e.g., baseline, video modelling treatment), occurrence of video presentation and order of presentations, and length of time engaged in task. In addition, there were three columns. In the first column each of the three behaviour targets were listed. In the second column, the author recorded relevant responses/behaviours. In the third column, the experimenter marked a tick when a behaviour target was achieved or a cross if a behaviour target was not achieved. Provision was made for

writing notes, in the event the experimenter noted anything of interest (e.g., verbal comments made, any imitation of non-behaviour targets shown on the modelling videos).

Behaviour targets were scored as achieved if they achieved the same outcome as the behaviour targets shown in the videos, and were initiated by Frances. That is, if Frances asked the experimenter what she wanted to choose to put on the timetable for at least one subject. If Frances negotiated in any way who would be teacher first (e.g., "I'll be teacher first, then we'll swap over"; "Would you like to be teacher first"; "Shall I be teacher first, or shall you?"). If Frances initiated the actual change in teacher roles when she was in the teacher role (e.g., "Your turn to be teacher," "Lets swap over," "Do you want to swap over").

Good conversation. For the first task, two good conversation cues (turn-taking, and checked interest), and one bad conversation cue (question after question) were assigned to the wrong/right video modelling treatment condition. For the second task, two bad conversation cues (butted in, and talked in monologue fashion) and one good conversation cue (both asked questions and made comments) were assigned to the right/right video modelling treatment condition. The procedure, instructions, criterion, and generalisation probes (playing on play equipment in playground) were as for Zac.

Data collection and dependent variable. As described for Matthew.

Brian

Road Safety. For both tasks, the same materials as were shown in the modelling videos were used. Brian was instructed that he and the experimenter were going to play at the school. All the materials for the road map (e.g., school, boy doll) were initially identified by the experimenter (e.g., "this is the school") and later the experimenter asked "What's this" or "Who is this" to test that Brian understood what the materials, and the dolls represented.

In the ball retrieval task, the experimenter instructed "Let's play ball." The right way exemplar in the wrong/right video modelling treatment condition contained the behaviour targets and the script comprised the form of this task. As previously mentioned the script is provided in Appendix G. To achieve the first behaviour

target, following the experimenter's question, "what happened", Brian was required to say "The ball went across the road." The experimenter then asked "What do we need to do to get the ball back." To achieve the second behaviour target, Brian was required to either walk the doll to the teacher doll, or say either "Get the teacher" or "Can you help me get the ball." To achieve the third behaviour target, following the experimenter's (as teacher) request ("When we get to the road we need to stop") Brian was required to initiate stopping on the footpath before he got to the road. For all behaviour targets, Brian was given 10 sec to respond.

In the road crossing task (right/right) the experimenter began with the first discriminative stimulus, "What do we need to do to cross the road safely." The first exemplar in the right/right video modelling treatment (see Appendix H) contained the behaviour targets and the script for the task comprised the form of this task. To achieve the first behaviour target, Brian was required to say either "look both ways" or "check for cars", or both. To achieve the second behaviour target, following the experimenter's question "Any cars coming," Brian was required to reply "Just the white one." To achieve the third behaviour target, following the experimenter's question, "Any more cars coming," Brian was to respond "No. Let's link hands and cross quickly." For all behaviour targets Brian was given 10 sec to respond.

Criterion was reached when the participant achieved all three behaviour targets across two consecutive sessions without video presentations. Generalisation probes were taken firstly, with a new person (therapist) in a new setting (outside on the driveway), and secondly with the experimenter in a new setting (outside on the driveway).

Data collection and dependent variable. The experimenter recorded the date, phase (e.g., baseline, video modelling treatment), occurrence of video presentation and order of presentations, and the order of tasks experienced by the participant. In addition for each task, there were three columns on the data collection form. In the first column the three behaviour targets were listed. In the second column, the experimenter recorded verbal and behavioural responses. In the third column, the experimenter marked a tick when a behaviour target was achieved or a cross if a behaviour target was not achieved. A space to write notes was also provided on the form where the experimenter noted anything of interest (e.g., verbal comments made,

any imitation of behaviour (but not a behaviour target) shown in the modelling videos).

Behaviours were scored as achieved if they achieved the same outcome as the behaviour targets shown in the videos. Furthermore, verbal responses, or actions without accompanying verbal responses were accepted. That is, any response that indicated that Brian was checking for cars either verbally (e.g., “check for cars” or “look both ways”) or turning the doll to the right and to the left was accepted. Any paraphrases of the statements were accepted.

Jacob

Oral Comprehension. The experimenter and the participant sat at the dining room table. The experimenter instructed the participant that she was going to read stories and then ask questions. The stories were presented in random order. Before each story was read the experimenter instructed the participant to “Listen carefully to the story”. Before she asked the questions relating to the story she instructed “I’m going to ask you two questions about that story.” In the first task, following each story, a ‘when’ and a ‘why’ question were asked in that order (right/right). In the second task, following each story, a ‘what’ and a ‘where’ question were asked in that order (wrong/right). Criterion was reached when 100% correct responding occurred over two consecutive sessions without video presentations.

Generalisation probes consisted of new stories for each task read by, the experimenter in the training setting, the experimenter in the generalisation setting (living room), by Jacob’s father in the training setting, and by Jacob’s father in the generalisation setting. The stories used for the WHEN and WHY questions in the generalisation probes are provided in Appendix Q. The stories used for the WHAT and WHERE questions in the generalisation probes are provided in Appendix R.

Data collection and dependent variable. The experimenter recorded the date, the phase (e.g., baseline, generalisation), the occurrence of the modelling video presentations, the order of video presentation, the order the tasks were experienced by the participant, and the total number of correct responses. Additionally on the data collection form the order the stories were presented was recorded, the stories were listed, the participant’s responses to the questions were recorded, and finally the

experimenter scored ‘C’ (correct) or ‘I’ (incorrect) for responses. Participant responses to the questions were scored as correct if they were an imitation, or paraphrase of the response made by the model in the videos.

Conversational reciprocity. For both tasks, the experimenter and the participant sat at the dining room table. For the first task, reciprocal statements (right/right), the experimenter read 10 different statements (e.g., “My favourite animal is a giraffe”) in random order and waited 5 sec for the participant to respond. Following a response, or if there was no response at the expiration of 5 sec, the experimenter continued with the next statement. For the second task, reciprocal questions (wrong/right), the experimenter asked 10 different questions (e.g., “What did you do today?”) in random order and waited for the participant to respond, and ask the same question of the experimenter. As for the first task, 5 sec was given for the participant to respond to the questions, and 5 sec was given for the participant to ask the reciprocal question of the experimenter. The experimenter answered the question, and, continued with the next question until all 10 questions were asked. Criterion was reached when 100% correct responding occurred over two consecutive sessions without viewing the videos.

Generalisation probes consisted of different statements and questions than those used in the video modelling treatment phase, and were read by the experimenter in the training setting, the experimenter in the generalisation setting (living room), by Jacob’s father in the training setting, and by Jacob’s father in the generalisation setting. The statements used in the generalisation probes for the reciprocal statements task are provided in Appendix S. The questions used in the generalisation probes for the reciprocal questions task are provided in Appendix T.

Data collection and dependent variable. The experimenter recorded the date, the phase (e.g., baseline, generalisation), the occurrence of the modelling video presentations, the order of video presentation, the order the tasks were experienced by the participant, and the total number of correct responses. The form contained four columns. In the first column the order the statements/questions were presented was noted. In the second column, the statement/question was listed. In the third column, the participant’s responses to the statements/questions were noted. In the fourth column, the experimenter scored ‘C’ (correct) or ‘I’ (incorrect) for each response.

For the reciprocal statements task, responses were scored correct if they followed the form provided in the statement (e.g., Experimenter: "My favourite colour is yellow," Jacob: "My favourite colour is blue").

For the reciprocal questions task, responses were scored correct if they included the same question the experimenter asked. Some variation was accepted (e.g., Experimenter: "How many people live at your house," Jacob: "How many people live in your house").

Interobserver Agreement

All sessions were recorded on video. An independent observer trained by the experimenter scored correct and incorrect responses from videos of the participants' performances. Forms provided to the observer contained a space for the date, participant, experimental phase and comprised two columns. In the first column, the dependent variables were noted. That is, all cues in the interested/bored and good conversation target behaviours/tasks; all questions and answers for the oral comprehension target behaviour; all statements/questions in the conversational reciprocity task; and the behaviour targets for the manners, road safety and turn-taking target behaviours. The independent observer was also given the criterion for scoring correct answers/behaviours. The criterion for scoring correct responses/behaviours for each participant was as previously detailed (i.e. Target Behaviours). In the second column, the rater marked 'C' for correct or 'I' for incorrect, dependant on whether the cue was identified correctly/behaviour targets achieved. Interobserver agreement was calculated by dividing the total number of agreements by the total number of agreements plus disagreements and multiplying by 100 (Cooper et al., 2007).

Reliability of Independent Variable

A reliability rater trained by the author scored the accuracy of the experimenter's performance of cues for the interested/bored and good conversation target behaviours/tasks. All sessions were videotaped. The rater watched the experimenter's performance of cues on the videos. A form was provided containing a space for the date, participant, experimental phase, and contained three columns. In

the first column the cues were noted. In the second column, the rater was required to note the order of the cues and thereby identify the cue. In the third column, the rater was to mark ‘A’ for agree or ‘D’ for disagree dependant on whether the cue was displayed correctly or not. Interobserver agreement was calculated by dividing the total number of agreements by the total number of agreements plus disagreements and multiplying by 100 (Cooper et al., 2007).

Social Validity

Social validation measures (Fawcett, 1991, Kazdin, 1977; Schwartz & Baer, 1991; Wolf, 1978) were used to assess the importance of the target behaviours, acceptability of video modelling as a procedure, and the importance of the treatment effects. Following completion of the intervention, a written questionnaire was forwarded to the parents of each participant (See Appendix U for a copy of the Parent Consumer Satisfaction Questionnaire)

RESULTS

For all participants for every session the number of correct responses were plotted against session numbers and are presented in Figures 1-4. Since sessions did not necessarily occur on successive days the axis does not represent real time. For all figures, session numbers are shown on the x-axis and the number of correct responses are shown on the y-axis. Double lines shown on the x-axis represent any period of more than a week (i.e., school holidays) when no data were collected.

For all figures, unfilled circles and filled circles represent the number of correct responses in sessions where training stimuli were used. More particularly, unfilled circles represent sessions where no feedback was delivered for responses/behaviour targets in the baseline phases, and in the video modelling treatment phase for the interested/bored and good conversation target behaviours/tasks. Filled circles represent sessions where feedback/positive social consequences were delivered in the video modelling treatment.

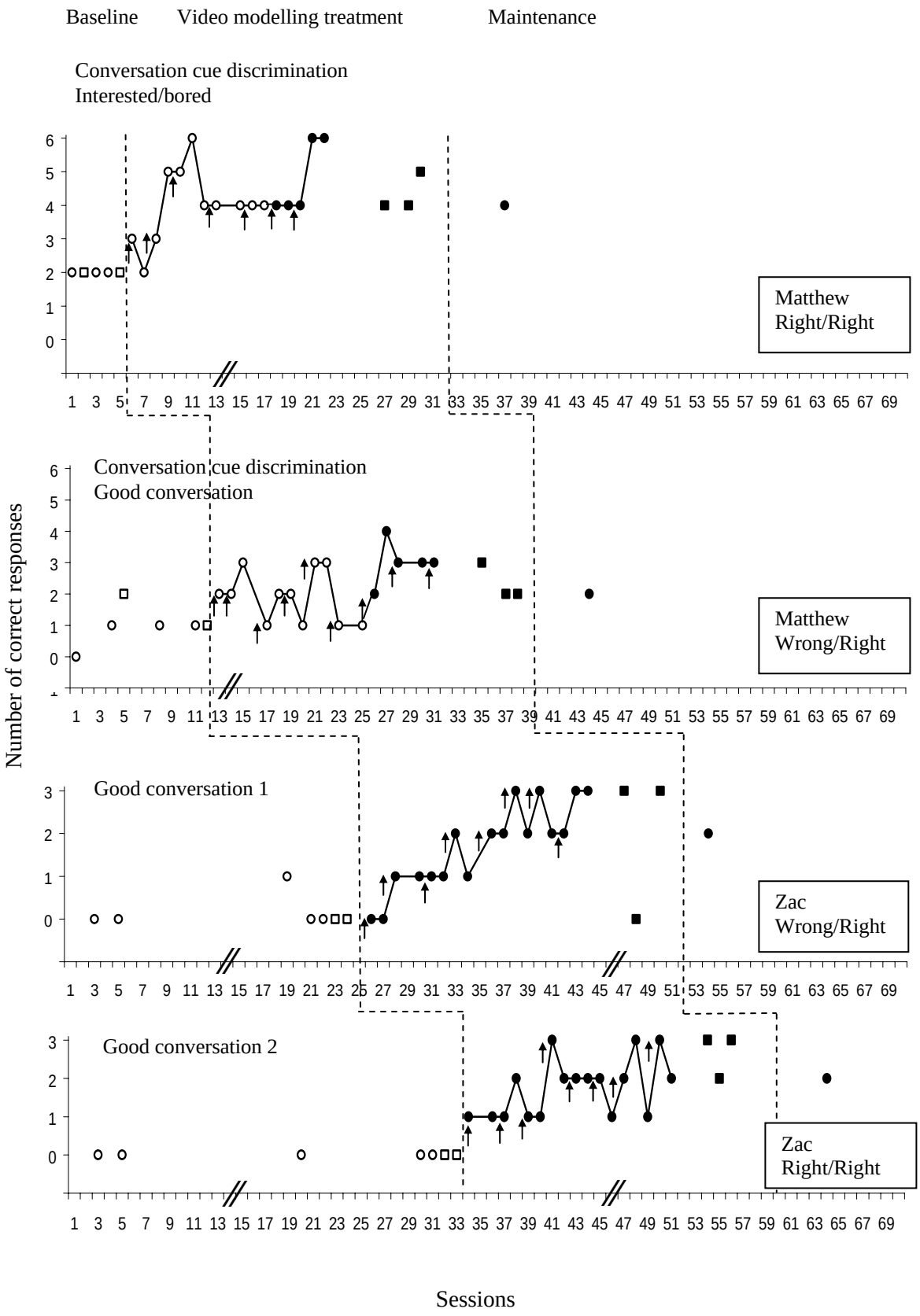
Unfilled squares and unfilled diamonds represent the number of correct responses/behaviour targets in the baseline generalisation probes, and filled squares and filled diamonds represent the generalisation probes following the video modelling treatment when feedback/positive social consequences were delivered. More particularly, squares represent the generalisation probes when the author acted as the experimenter, and diamonds represent the generalisation probes when one of the participant's family acted as the experimenter. Vertical arrows shown in the modelling treatment symbolise sessions where the video was viewed prior to testing for skill acquisition.

Matthew

Conversation Cue Discrimination

All data for all sessions for Matthew are shown in the first two tiers of Figure 1. The first task experienced by Matthew was the interested/bored task (right/right). The second task experienced by Matthew was the good conversation task (wrong/right).

Figure 1. Number of correct responses across baseline sessions, video modelling treatment sessions, generalisation probes, and maintenance probes for Matthew and Zac plotted against session numbers. Unfilled circles depict baseline probes and training sessions where no feedback was delivered; unfilled squares depict baseline generalisation probes where no feedback was delivered; filled circles depict training sessions and maintenance probes where feedback was delivered; filled squares depict generalisation probes where feedback was delivered. Vertical arrows symbolise sessions where the video was viewed prior to testing for skill acquisition.


Baseline
Video modelling treatment
Maintenance
Conversation cue discrimination
Interested/bored
Matthew
Right/Right
Conversation cue discrimination
Good conversation
Matthew
Wrong/Right
Number of correct responses
Good conversation 1
Zac
Wrong/Right
Good conversation 2
Zac
Right/Right
Sessions

Right/right. For the interested/bored task Matthew identified two cues accurately, in each of the three baseline probes (unfilled circles), and in each of the two baseline generalisation probes (unfilled squares).

When the video modelling treatment was introduced no feedback was delivered (unfilled circles). Figure 1 shows that correct responses increased, and after four video presentations (including the first two) Matthew identified all six interested/bored cues accurately (on one occasion only). Correct responses then decreased and stabilised at four correct for the remainder of the sessions without feedback (five sessions). Following the 11th training session (Session 18) feedback was delivered (filled circles). Correct responses continued at four correct for three sessions and increased to six correct in Sessions 21 and 22. Criterion (identifying all six interested/bored cues accurately over two sessions without video presentations) was achieved. Eight video presentations (across 16 sessions) were required before criterion was met.

Criterion was not met in the generalisation probes across settings (playground), where Matthew scored between four and five correct responses (filled squares). Additionally, criterion was not met in the maintenance probe, when Matthew scored four correct responses (filled circle).

Wrong/right. For the good conversation task, Matthew identified between zero and one cue accurately in the four baseline probes (unfilled circles). In the two generalisation probes (unfilled squares), Matthew identified between one and two cues accurately.

When the video modelling treatment began (Session 13) school children were participating in group sports outside the training setting (classroom). The noise level was high which made it difficult to hear the videos. To remedy this problem the videos were shown again in the following session when minimal noise interfered with video viewing. Matthew did not receive feedback (unfilled circles) when treatment commenced. Figure 1 shows Matthew's performance improved but was variable and ranged between one and three correct responses. When Matthew had experienced the same number of training sessions without feedback (11) as for the interested/bored task, feedback was delivered (filled circles), and as Figure 1 shows, a small increase in correct responding (four correct) occurred, however responding stabilised at three

correct for the following three sessions (Sessions 28-31). In Session 31 training ended because Matthew had experienced the same number of training sessions as for the interested/bored task (16). Criterion was not reached.

Between two and three correct responses (filled squares) were scored for the generalisation probes across settings (playground). Hence, criterion was not met. Criterion was not reached in the maintenance probe (two correct responses).

Complaints

Matthew made complaints from time to time. In the interested/bored task, when the video modelling treatment began, and when feedback was not delivered (unfilled circles), Matthew asked the experimenter why she did not tell him whether his responses were correct as she did with the video models. Matthew complained about the requirement for repeated viewings of the videos (if criterion was not met for two sessions, the videos were presented again).

In addition, Matthew made complaints about the tasks. Matthew stated in Session 13 of the interested/bored task (right/right) that he was bored with the videos and said he knew them "off by heart." In the Sessions 14 (during good conversation task) and 21 shown in Figure 1, Matthew complained that he hated the interested/bored task. On the second occasion (Session 21), when asked by the experimenter why he hated it, he complained "we do it too much."

For the good conversation task (wrong/right), in Session 27 Matthew complained that he was getting sick of the task.

Response Generalisation

Right/right. In Session 27 (generalisation probe) of the interested/bored task, Matthew incorrectly offered "because we both got a chance to talk," a cue in the good conversation task. In Session 37 (maintenance probe), Matthew incorrectly offered "because I didn't let you have a chance to talk," a conversational mistake in the good conversation task.

Wrong/right. In Session 14 of the good conversation task, Matthew incorrectly offered "because you answered my question," a cue from the

interested/bored task. In Sessions 28 and 31, Matthew incorrectly offered "because you asked a question," a cue from the interested/bored task.

Evidence of the Effectiveness of Video Training

Right/right. For the interested/bored task, apart from "don't know" and "not sure," the only baseline responses which remained following commencement of the video modelling treatment were "you sounded interested" and "because you sound happy." Both these responses occurred as separate responses in the baseline phase but occurred together as one response in one training session (Session 12). The response "because you sound happy" (or paraphrase) occurred in Sessions 6, 7, 8, 10, 11, 12, 13, 19, and 29.

Wrong/right. Apart from "I don't know" and "not sure" which were not demonstrated as incorrect responses in the wrong way video, the only baseline response in the good conversation task that remained until the end of all training, generalisation and maintenance sessions was "because we were both happy," a response demonstrated in the wrong way video. This response occurred in Sessions 18, 19, 25, 26, 30, 31, 37, and 44.

Zac

Good Conversation

All data for all sessions for Zac are presented in the third and fourth tiers of Figure 1. The first task experienced by Zac was the good conversation 1 task (wrong/right). The second task experienced by Zac was the good conversation 2 task (right/right).

Wrong/right. For the good conversation 1 task, Zac identified one cue correctly, in one of five baseline probes (unfilled circles). In the remaining four baseline probes no correct responses were scored. Figure 1 shows that Zac did not identify any cues accurately in either of the two baseline generalisation probes (unfilled squares).

When the video modelling treatment began Zac received feedback (filled circles). Figure 1 shows an increased trend in correct responses for 17 sessions until criterion was met (identifying all three interested/bored cues accurately over two

sessions without video presentations). Nine presentations of the wrong/right videos were required to reach criterion.

Criterion was not reached in the generalisation probes across settings (walking in park), although on two of the three occasions, three correct responses occurred, but not successively (filled squares). Zac commented during the second generalisation probe (when no cues were identified correctly) that he was awake most of the night worrying about school. Prior to the school holidays he had been stood down from school. Criterion was not achieved in the maintenance probe, where two of the three cues were identified correctly (filled circle).

Right/right. Figure 1 shows, for the good conversation 2 task (fourth tier), no correct responses occurred in the five baseline probes (unfilled circles), nor in the two baseline generalisation probes (unfilled squares).

When the video modelling treatment began feedback was delivered (filled circles). Figure 1 shows an increased trend in correct responding for seven treatment sessions (Sessions 34-41) stabilising at two correct responses for four sessions. Zac's performance became variable for the next six sessions ranging between one and three correct responses. After nine presentations of the right/right videos criterion was not met and training ended because Zac had experienced the same number of training sessions (17) as for the good conversation 1 task.

Criterion was not met in the generalisation probes across settings (walking in park), however, on two occasions all three cues were correctly identified (not consecutively). In the maintenance probe, criterion was not met (two correct responses).

Complaints

Zac did not complain about the requirement to watch the videos repeatedly nor did he complain about the tasks.

Response Generalisation

Wrong/right. In Session 37 of the good conversation 1 task, Zac incorrectly offered "talked about what I was interested in," a cue from the good conversation 2 task.

Right/right. On nine occasions (Sessions 39, 40, 43, 45, 46, 49, 51, 55, and 64) of the good conversation 2 task, Zac incorrectly offered "took turns talking," a cue from the good conversation 1 task.

Evidence of the Effectiveness of Video Training

Wrong/right. When the video modelling treatment commenced in the good conversation 1 task no baseline responses demonstrated in the wrong way video were repeated by Zac. However, 13 baseline-like (i.e., similar to those given in the baseline phase) responses (e.g., "because we were both listening") from a total of 24 opportunities to respond remained during the first eight training sessions. These responses were not demonstrated in the wrong way video.

Right/right. For the good conversation 2 task, apart from "can't tell or "don't know," from the time video modelling treatment began, no baseline-like responses were repeated.

Jack

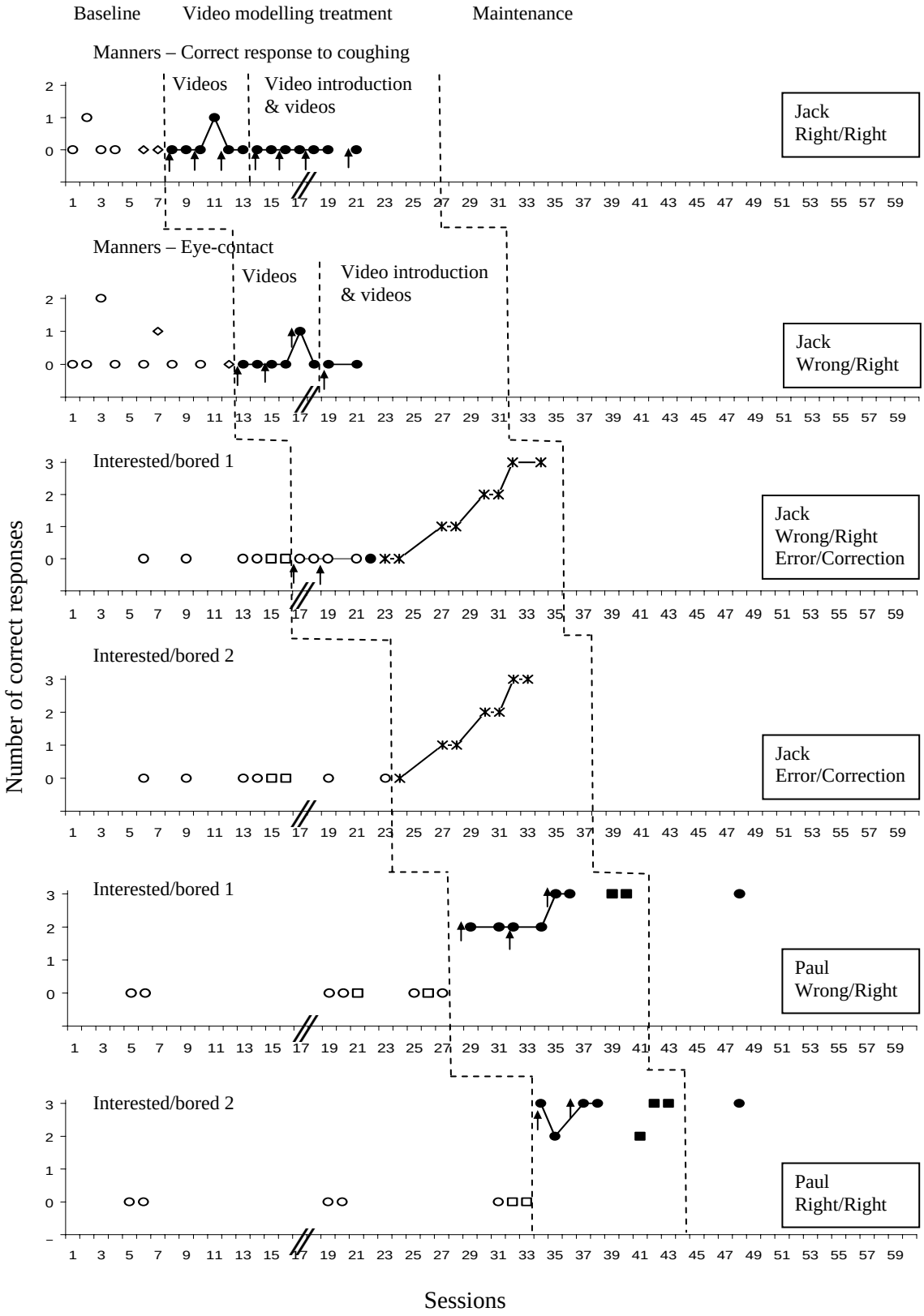
Jack experienced two target behaviours, manners which was experienced first, and the interested/bored target behaviour which was experienced second. All data for all sessions for Jack are presented in the first four tiers of Figure 2.

Manners

The first task experienced by Jack was the correct response to coughing task (right/right). The second task experienced by Jack was the eye-contact task (wrong/right).

Right/right. For the coughing task, when the experimenter coughed (average of eight discrete coughs), Jack responded correctly with "Are you right" once in the four baseline probes (unfilled circles). In the remaining three baseline probes, Jack smiled when the experimenter coughed, and on one occasion Jack asked "Why do you cough every time." In the two baseline generalisation probes conducted by Jack's brother (unfilled diamonds) no correct responses occurred. In one of these baseline generalisation probes (Session 7) Jack smiled and giggled when his brother coughed. Figure 2 shows that when the video modelling treatment began Jack

Figure 2. Number of correct responses across baseline sessions, video modelling treatment sessions, generalisation probes, and maintenance probes for Jack and Paul plotted against session numbers. Unfilled circles depict baseline probes and training sessions where no feedback was delivered; unfilled squares depict baseline generalisation probes conducted by the experimenter where no feedback was delivered; unfilled diamonds depict baseline generalisation probes conducted by Jack's brother where no feedback was delivered; filled circles depict training sessions and maintenance probes where feedback was delivered; filled squares depict generalisation probes where feedback was delivered. Crosses depict correct responses for the modified error and correction task. Vertical arrows symbolise sessions where the video was viewed prior to testing for skill acquisition.


Baseline
Video modelling treatment
Maintenance
Manners – Correct response to coughing
Videos
Video introduction & videos
Jack Right/Right
Manners – Eye-contact
Videos
Video introduction & videos
Jack Wrong/Right
Interested/bored 1
Jack Wrong/Right Error/Correction
Interested/bored 2
Jack Error/Correction
Interested/bored 1
Paul Wrong/Right
Interested/bored 2
Paul Right/Right
Number of correct responses
Sessions

responded correctly ("Are you okay") once (Session 11) in six treatment sessions. In the remaining five sessions Jack either did not respond, smiled when the experimenter coughed, and/or made comments (i.e., "You seem like you are coughing much in life," "So when's the next time you are coming").

When the video introduction was presented (Session 14) no correct responses occurred for the remainder of the sessions (Sessions 14-21). During these sessions Jack continued either to make no response (Sessions 9, 17), smile (Sessions 13, 14, 16, 18, and 19), or comment "Why do you always cough when you come" (Session 19). Figure 2 shows that after seven presentations of the videos including three presentations of the video introduction, criterion was not reached.

In Session 21, Jack was asked to do exactly the same as in the video. When the experimenter coughed Jack replied "Okay, right, okay, so it's over." At this point Jack was asked to describe the videos. He verbalised that it was important not to be impolite, and further if someone coughed a person should say "Are you alright." When Jack was asked why he did not say "Are you alright. Can I get you anything" when the experimenter coughed, he replied "I don't like to." Training ended. Generalisation and maintenance were not tested.

Wrong/right. For eye-contact, Jack altered his body posture and responded correctly by turning his body and looking at the experimenter in one of the seven baseline probes (unfilled circles). Jack turned his body (one behaviour target) in one of the two baseline generalisation probes conducted by Jack's brother (unfilled diamonds).

When the video modelling treatment began (filled circles), Jack commented that both videos (right way and wrong way) were the same. The second time Jack viewed the videos (Session 15) he asked the experimenter why she did not reply to the model in the wrong way video. The experimenter did not reply. Figure 2 shows that no correct behaviours occurred until after the third video presentation (Session 17) when Jack made eye contact with the experimenter.

When the video introduction was presented (Session 19) Jack commented that the author had done the wrong thing by not answering the video model in the wrong-

way video. No further behaviour targets occurred and after five presentations of the wrong/right videos including one presentation of the video introduction Jack refused to watch the videos complaining that they were boring. Training ended. Criterion was not met. Generalisation and maintenance were not tested.

Response Generalisation

No response generalisation (i.e., acquisition of behaviour caused an untreated behaviour to occur (Bailey & Burch, 2002)) occurred.

Evidence of the Effectiveness of Video Training

For both the manners tasks (except where behaviour targets occurred) baseline responses remained unchanged throughout the treatment sessions.

Interested/Bored

The interested/bored 1 task was experienced by Jack first (wrong/right), with the interested/bored 2 task experienced second (right/right) and are presented in the third and fourth tiers of Figure 2.

Wrong/right. For the interested/bored 1 task, Jack did not identify any interested or bored cues correctly in the four baseline probes (unfilled circles). In the two baseline generalisation probes (unfilled squares) no correct responses were scored.

When the video modelling treatment began no feedback was delivered to Jack for four sessions (unfilled circles). Jack did not identify any cues correctly (Sessions 17-21). In the fifth session (Session 22) feedback was delivered (filled circles) however at this time Jack refused to watch the videos. No cues were identified correctly in the video modelling treatment. Criterion was not met.

At this time the task was modified (error and correction). Fifty cents and praise were delivered for correct responses, and following every incorrect response, Jack was told the correct response (crosses). In addition following responses Jack wrote a tick (for correct response) or a cross (for incorrect response) on a sheet of paper. Figure 2 shows an increased trend for the following eight sessions (Session 23 to 34). Jack reached criterion after eight error and correction sessions (identified

three cues accurately over two consecutive sessions). Generalisation and maintenance were not tested.

Right/right. For interested/bored 2, Jack did not identify any cues correctly in the six baseline probes (unfilled circles). No cues were identified correctly in the two generalisation probes (unfilled squares).

No treatment involving presentations of the right/right videos were made due to Jack's refusal to watch. In the treatment sessions conducted 50 cents and praise were delivered as described above (error and correction). Figure 2 shows an increased trend for seven treatment sessions (Sessions 24-33) when criterion was met. Generalisation and maintenance were not tested.

Response Generalisation

Wrong/right. For the interested/bored 1 task, Jack did not incorrectly offer any cues that were part of the interested/bored 2 task.

Right/right. For the interested/bored 2 task, during training for the error and correction task, in Sessions 27, 28, and 30, Jack incorrectly offered "because you answered," a cue from the interested/bored 1 task.

Evidence of the Effectiveness of Video Training

Wrong/right. For the interested/bored 1 task, prior to its modification to an error and correction task, baseline responses demonstrated in the wrong way videos remained as did Jack's baseline responses (not demonstrated in the wrong way video) throughout the video modelling treatment. The only responses that varied when the video modelling treatment began were Jack's responses when asked whether the experimenter was interested or bored. That is, in every instance in baseline Jack responded with "you were interested." When the video modelling treatment began, Jack varied his response, sometimes saying 'bored.' This response was correct when offered in Session 19, and was incorrect when offered in Session 21.

When the interested/bored 1 task was modified to the error and correction task, for two sessions (Sessions 23 and 24) Jack's responses were like those he gave in the baseline phase, except that "bored" was now incorrectly offered once in each of Sessions 23 and 24. For all sessions following the second error and correction

session (Session 24) no responses were like Jack's baseline responses and/or those demonstrated in the wrong way video.

Right/right. For the interested/bored 2 task, in the first error and correction training session (Session 24) two of the three responses were like Jack's baseline responses. For all sessions following this session no responses were like his baseline responses.

Complaints

For both target behaviours, Jack made complaints from time to time. In the baseline phase of the interested/bored tasks, Jack asked the experimenter on more than one occasion why she did not tell him if his answers were correct. When the video modelling treatment commenced and feedback was not delivered (unfilled circles), Jack asked the experimenter why she did not tell him whether his answers were correct or not, as she did with the video models. Jack, in successive sessions stated that he did not understand why the experimenter did not give this feedback.

Jack complained about viewing the videos repeatedly. On several occasions Jack expressed negative comments across all tasks when asked to view the videos (e.g., "No thanks, I've seen them") and complained the videos were boring.

When Jack refused to watch the videos he complained "I've had enough of watching the videos. Whenever I watch the video the same thing is going to happen."

Paul

Interested/Bored

All data for all sessions for Paul are presented in the fifth and sixth tiers of Figure 2. The first task experienced by Paul was the interested/bored 1 task (wrong/right). The second task experienced by Paul was the interested/bored 2 task (right/right).

Wrong/right. For interested/bored 1, no cues were identified correctly in the six baseline probes (unfilled circles). Paul did not identify any cues correctly in the two baseline generalisation probes (unfilled squares).

Feedback was delivered from the introduction of the video modelling treatment (filled circles). Figure 2 shows that when the video modelling treatment

began an increased trend in correct responding occurred across six sessions until criterion was reached (all three interested/bored cues identified correctly on two occasions without video presentations). Four video presentations of the wrong/right videos were required for Paul to reach criterion. Criterion was met in the generalisation probes across settings and in the maintenance probe.

Right/right. For interested/bored 2, Paul did not identify any cues correctly in the five baseline probes (unfilled circles). Paul did not identify any cues correctly in the two baseline generalisation probes (unfilled squares). Feedback was delivered when the video modelling treatment began (filled circles). Figure 2 shows for four sessions between two and three correct responses occurred. After three presentations of the right/right videos over four sessions criterion was met. Criterion was met in the generalisation probes across settings (lunch area) and in the maintenance probe.

Complaints

Paul did not complain about the requirement to watch the videos repeatedly nor did he complain about the tasks.

Response Generalisation

Wrong/right. Paul did not incorrectly offer any cues which were part of the interested/bored 2 task.

Right/right. When the video modelling treatment began for the interested/bored 1 task (wrong/right) Paul varied his responses in the baseline phase (Sessions 31-33) of the interested/bored 2 task. Paul's responses varied from the content of the conversation (e.g., "cos you like to hear what I do in the weekend") to responses about the experimenter (e.g., "cos you were happy"), however he did not identify the cues correctly. This occurred for one response in Session 31, and for two responses in each of Sessions 32 and 33.

Evidence of the Effectiveness of Video Training

Wrong/right. For the interested/bored 1 task, Paul incorrectly offered one baseline-like response (e.g., "Because I was telling you what I like doing with helicopters") demonstrated in the wrong-way videos (e.g., "because I told you about

what our house was doing") in each of the first two video modelling sessions (Sessions 29 and 31). No further baseline-like responses were made.

Right/right. For the interested/bored 2 task, in one generalisation probe (Session 41) one incorrect baseline-like response occurred (i.e., "Because I told you what movie we were going to see").

Frances

Frances experienced two target behaviours, turn-taking which was experienced first, and the good conversation target behaviour which was experienced second. All data for all sessions for Frances are presented in the first three tiers of Figure 3.

Turn-taking

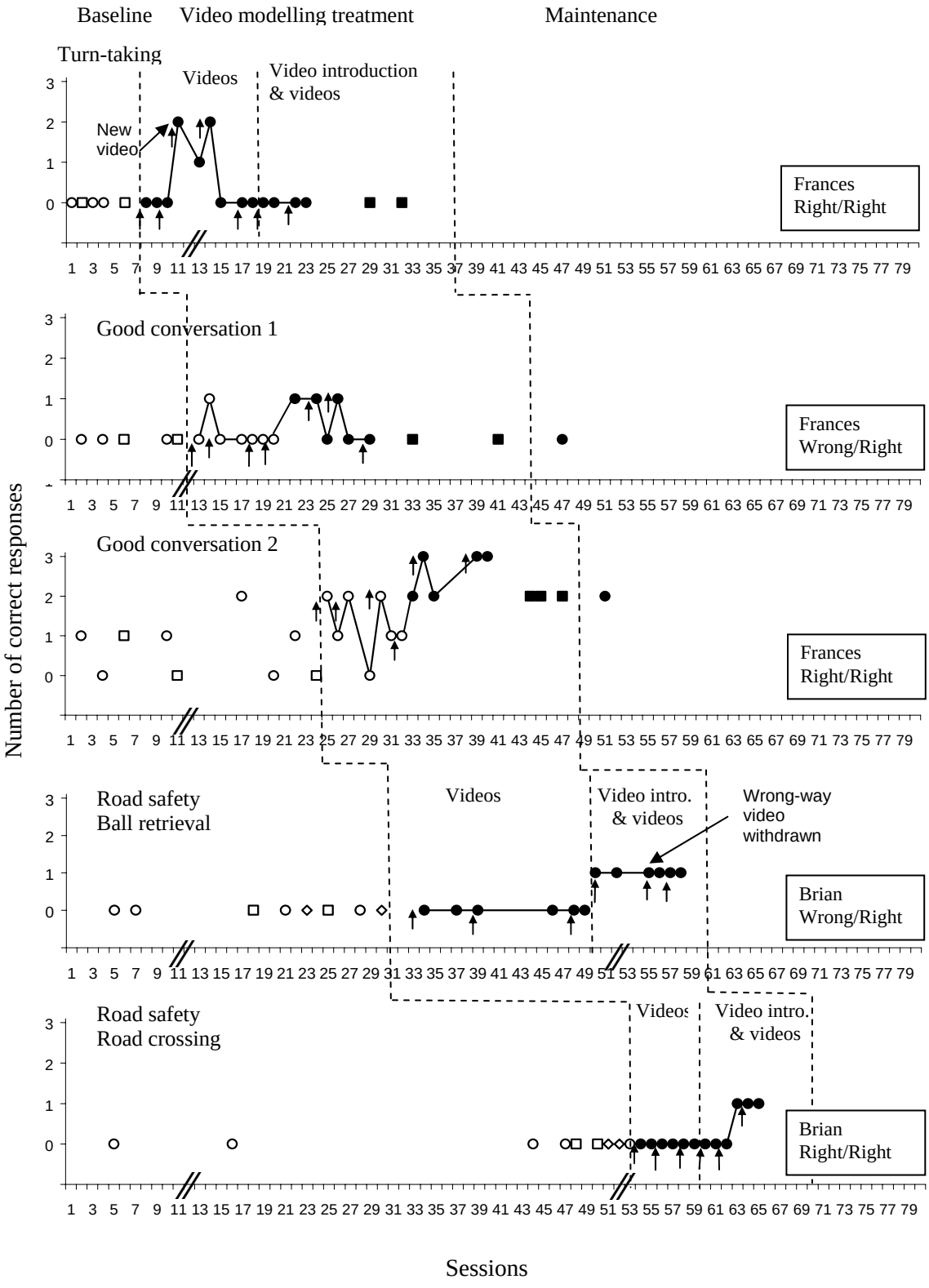
The turn-taking target behaviour contained only one task known by the same name (right/right).

Right/right. In the three baseline probes (unfilled circles), and in the two baseline generalisation probes (unfilled squares), Frances did not display any of the three behaviour targets. When the modelling treatment began, for the first three sessions, no behaviour targets were displayed. However, in Session 10 Frances imitated one non-behaviour target shown in the videos (i.e., writing a timetable as the models did). Following the second video presentation (Session 10) Frances' mother reported that Frances had complained to her that the models shown in the videos were 'babyish.'

Following introduction of new videos with different models (Session 11), for three sessions, Frances imitated between one and two of the three behaviour targets, and for six sessions (Sessions 11, 13, 14, 15, 17, and 18) imitated seven non-behaviour targets (e.g., used exact phrases the video model used, used the same words used in the video for spelling, chose the same timetable subjects). However no behaviour targets were displayed from Session 15 to 18 (four sessions).

The video introduction was presented in Session 19. Following viewing of the video introduction, Frances stated "and we're not taking turns, cos it's quicker then if we don't take turns." Further, in this session, at the beginning of the turn-

Figure 3. Number of correct responses across baseline sessions, video modelling treatment sessions, generalisation probes, and maintenance probes for Frances and Brian plotted against session numbers. Unfilled circles depict baseline probes and training sessions where no feedback was delivered; unfilled squares depict baseline generalisation probes conducted by the experimenter where no feedback was delivered; unfilled diamonds depict baseline generalisation probes conducted by Brian's therapist were no feedback was delivered; filled circles depict training sessions and maintenance probes where feedback was delivered; and filled squares depict generalisation probes where feedback was delivered. Vertical arrows symbolise sessions where the video was viewed prior to testing for skill acquisition.


Baseline
Video modelling treatment
Maintenance
Turn-taking
Videos
Video introduction & videos
New video
Frances Right/Right
Good conversation 1
Frances Wrong/Right
Good conversation 2
Frances Right/Right
Road safety Ball retrieval
Videos
Video intro. & videos
Wrong-way video withdrawn
Brian Wrong/Right
Road safety Road crossing
Videos
Video intro. & videos
Brian Right/Right
Number of correct responses
Sessions

taking task, Frances suggested that the experimenter bring chocolates which could be handed out if she and the experimenter (as play partner) were good. At the end of the session as Frances was leaving she commented "if you bring the chocolates I'll take turns."

In Sessions 15, 17, 18, and 20, near the end of the 7 minute play session the experimenter casually asked "Are we going to swap over today." Frances either replied with a flat "no" or indicated there was no time. On one occasion Frances announced there would be no turn-taking.

While Frances watched the second presentation of the video introduction in the 12th treatment session she verbalised "I don't like this. It's boring. It doesn't mean I have to share with you." In the following two sessions play deviated from previous sessions, which comprised the form shown in the videos (e.g., writing timetable with three subjects, and completing the subjects in play) to no timetable and reading occurred (e.g., "We're just going to do reading most of the time so I can't change it"). Therefore, training ended. No behaviour targets were imitated for the previous seven sessions. Throughout the baseline and treatment sessions, play sessions often ran over the 7 min set for this task as Frances prolonged play beyond the instruction to finish.

After eight presentations of the right/right videos, including two presentations of the video introduction, criterion was not reached. When Frances was asked to describe what she saw in the videos she verbalised that the videos were about sharing and taking turns. When Frances was asked why she did not take turns when she played schools with the experimenter she said it could not happen when there was a lot to do.

Figure 3 shows that Frances displayed no behaviour targets in the two generalisation probes across stimuli (playing doctors). In the second generalisation probe (Session 32) Frances indicated she did not want to play but complied after 5 min. In the previous session the probe was not completed as Frances refused to play.

Complaints. Only two complaints were recorded. Firstly, the complaint about the models being 'babyish', and secondly the complaints made (mentioned above) in the 12th treatment session when the video introduction was presented.

Good Conversation

All data for all sessions for Frances are presented in the second and third tiers of Figure 3. The first task experienced by Frances was the good conversation 1 task (wrong/right). The second task experienced by Frances was the good conversation 2 task (right/right).

Wrong/right. For good conversation 1, no correct responses occurred in the three baseline probes (unfilled circles), and in the two baseline generalisation probes (unfilled squares).

When the video modelling treatment began no feedback was delivered (unfilled circles). Figure 3 shows that apart from one correct response which occurred in Session 14 no correct responses were scored in the remaining six treatment sessions where no feedback was delivered (Sessions 13-20). In the eighth treatment session (Session 22) feedback was delivered (filled circles). Frances' performance increased but was variable and ranged between zero and one correct response. After eight presentations of the wrong/right videos (13 sessions) criterion was not reached and training ended. No correct responses occurred in the generalisation probes across settings (playground), or in the maintenance probe.

Right/right. For good conversation 2, in the six baseline probes (unfilled circles), Frances' performance was variable and ranged between zero and two correct responses. In the three baseline generalisation probes (unfilled squares) variable responding is shown where between zero and one correct response occurred.

When the video modelling treatment began Frances did not receive feedback for responses (unfilled circles). For seven sessions (Sessions 25-32) Frances' performance was variable and ranged between zero and two correct responses. Feedback was delivered in the eighth treatment session (filled circles), correct responses increased and five sessions later (Sessions 33-40) criterion was reached (all three conversation cues identified correctly on two consecutive occasions without video presentations). In Session 36 Frances declined to come to the session, and in Session 38, Frances refused to complete the task. Seven presentations of the right/right videos across 12 sessions were required to meet criterion.

Criterion was not reached in the generalisation probes across settings (two correct responses) nor was it reached in the maintenance probe (two correct responses). During the generalisation and maintenance probes Frances was reluctant to choose topics and converse with the experimenter.

Complaints

Frances made complaints regarding the good conversation target behaviour. When feedback was not delivered (unfilled circles) in the good conversation 1 task, Frances asked the experimenter why she was not told whether her responses were correct or not as the video models were (Session 15). Occasionally, following a response identifying whether the conversation was good or not, Frances asked the experimenter "was it right or wrong?" or "what was it?" For good conversation 1 this occurred in Sessions 25 and 29. For good conversation 2 this occurred in the baseline phase at Session 22.

Frances also complained about the requirement to view the videos repeatedly. In good conversation 1 (wrong/right), during the second video presentation (Session 15), Frances complained, "Boring, seen videos before" and when the video ended, said "I wasn't listening." Further complaints were received from Frances for this task (Session 18) during video viewing (e.g., "This is the third time I've had to watch this. Why do I have to watch this over and over"). In one session while Frances was watching the videos she attempted to fast forward the video.

During both tasks on some occasions Frances did other things (e.g., sharpening pencils, making a card, completing a science project) while watching the videos or doing the tasks, despite requests from the experimenter to stop and concentrate on the videos or task.

Response Generalisation

Frances did not incorrectly offer any cues in the good conversation 1 task that were correct cues of the good conversation 2 task and vice-a-versa.

Evidence of the Effectiveness of Video Training

Wrong/right. Apart from "I don't know," when the video modelling treatment commenced, Frances' responses in the good conversation 1 task became more like the sample of her incorrect baseline responses used in the wrong way video. For example, some baseline responses were "Good, because we talked about what we liked," and "Interesting, because we know what we did when we were babies."

In the wrong-way modelling videos, the model responded with "It was good because we found out about our families," "Good, because you found out lots about my school," and "It was good because we both like animals." When the video modelling treatment began, Frances responded, "Good, because we got to know about when we do Ten-pin bowling," "Good, because we got to know about how we felt," and "Good, because we got to know what we like." These types of responses occurred for 36 of 48 opportunities to respond (16 sessions) during the video modelling treatment, generalisation and maintenance probes. Apart from correct responses, only five responses varied from those that were like her baseline responses demonstrated in the wrong way video.

Right/right. Apart from correct responses and "I don't know," for the good conversation 2 task, 15 responses from a total of 48 opportunities to respond (16 sessions) across treatment, generalisation and maintenance phases were like Frances' baseline responses.

Brian

Road Safety

All data for all sessions for Brian are presented in the fourth and fifth tiers of Figure 3. The first task experienced by Brian was the ball retrieval task (wrong/right). The second task experienced by Brian was the road crossing task (right/right).

Wrong/right. For ball retrieval, in the four baseline probes and in the four baseline generalisation probes, no behaviour targets were displayed. More particularly, in three baseline sessions (Sessions 7, 21, 28), and in one baseline

generalisation probe (Session 18), for the first behaviour target, Brian said he needed to get the ball (e.g., “I’ll get the ball, it’s in the water,” “Have to get the ball”) but did not move his doll during the baseline sessions.

When the video modelling treatment began, in each of the first two sessions (34 and 37) Brian’s comments about getting the ball continued. In the next four training sessions (39, 46, 48, 49) Brian made the same comments but also moved his doll across the road. On each occasion the experimenter gave the consequence shown in the video (i.e., “Phew that was close, that’s the wrong way to cross the road and get the ball”). Figure 3 shows that following the presentation of the video introduction, one behaviour target occurred (“The ball went across the road”) however Brian also said “I’ll go get it” and moved his doll across the road (Sessions 50 and 52). This was an exact imitation of the wrong-way video model. From Session 55, the wrong-way video was withdrawn for ethical reasons. That is, it was undesirable for Brian to practise getting the ball the wrong way. One behaviour target continued to be displayed (the first target) for the next two training sessions, however Brian continued to say “I’ll go get it” and moved his doll across the road. The consequence shown in the video continued to be delivered by the experimenter. For the last two sessions before training ended (Sessions 57 and 58) additionally, the experimenter blocked Brian from moving his doll across the road (for ethical reasons) by placing her hand in front of the road so that Brian could not practise getting the ball the wrong way. One behaviour target continued to be displayed by Brian until training ended (the first target on all occasions).

At the end of training, when Brian was asked to describe what he saw in the videos, he replied “I see a truck and a bus and a car.” Brian was asked “What did you see little Brian doing.” He replied “play with the ball.” Brian was prompted in this way to describe the videos. When he was unable to reply, the experimenter played a segment of the video and asked Brian what he saw. Brian was unable to reply without experimenter-prompts (e.g., Little Brian has to get the “t”? (teacher)). Criterion was not met and training ended. Generalisation and maintenance were not tested.

Right/right. For road crossing, in the five baseline probes, Brian did not display any of the behaviour targets. In Sessions 5, 16, and 47, Brian walked his doll across the road, and on one occasion Brian also walked the teacher doll across the road. In the four baseline generalisation probes, Brian did not display any of the behaviour targets, but walked his doll across the road in Sessions 50, 51 and 52.

When the video modelling treatment began no behaviour targets were imitated but Brian continued to walk his doll across the road. From Session 57 onwards, for ethical reasons, the experimenter blocked Brian from crossing the road by placing her hand in front of the road. This occurred so Brian could not practise the wrong behaviour of walking his doll across the road without checking for cars. When the video introduction was presented no behaviour targets were displayed for a further three sessions. From Session 63 to 65, the first behaviour target occurred. However, at this point training ended because Brian had received the requisite number of video presentations (see Method). Criterion was not met.

Following training, when Brian was asked to describe what he saw in the videos, he replied "I see the boy cross the road." When Brian was asked "what does he say he has to do first to cross the road" Brian did not reply. The video was presented to Brian in short segments and following each segment the experimenter asked Brian what he saw. Brian was unable to reply without verbal prompts (e.g., "What does little Brian say"). No generalisation or maintenance probes were taken.

Complaints

Brian did not complain on any occasion about the requirement to watch the videos repeatedly nor did he complain about the tasks.

Response Generalisation

Wrong/right. For the ball retrieval task, in Session 57, Brian incorrectly moved a toy car along the road. This was part of the modelling video for the road crossing task.

Right/right. In Session 49 (baseline) and Sessions 50 and 53 (baseline generalisation) Brian incorrectly offered part of the script and behaviour target for the

ball retrieval task (e.g. “Oh no, what happened. The ball went across the road,” “I’ll go get it”). In Session 57 (training) Brian incorrectly offered “The ball went across the road”, a behaviour target from the ball retrieval task. In Session 59, Brian incorrectly offered “Let’s play ball”, part of the experimenter’s script from the ball retrieval task.

Evidence of Effectiveness of Video Training

Wrong/right. From the seventh training session baseline responses (i.e., verbal comments about needing to get the ball) were eliminated.

Right/right. From the eighth training sessions, baseline responses (i.e., walking doll across the road) were eliminated.

Jacob

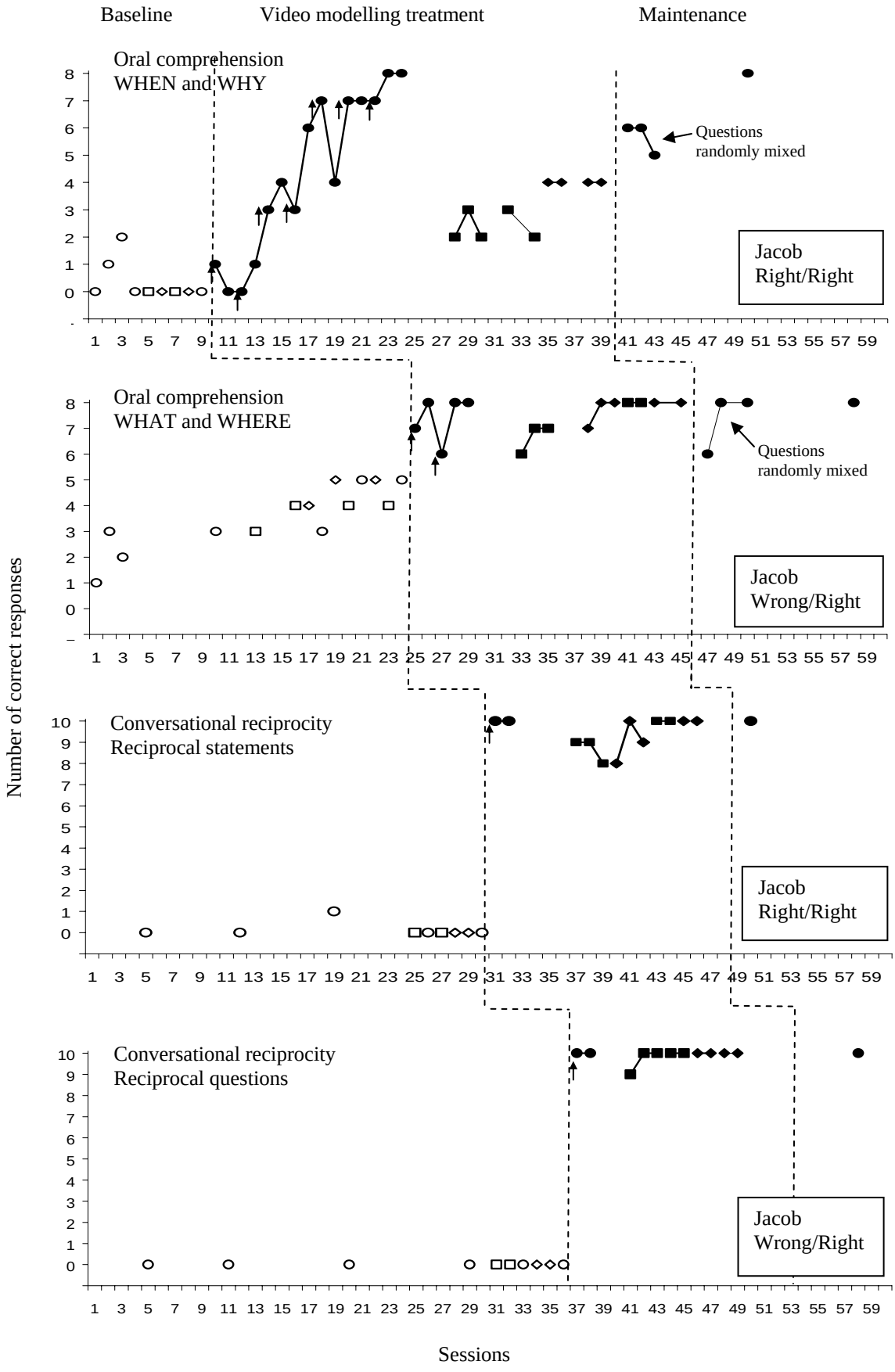
Jacob experienced two target behaviours, oral comprehension which was experienced first, and conversational reciprocity which was experienced second. All data for all sessions for Jacob are presented in Figure 4.

Oral Comprehension

The first task experienced by Jacob in the oral comprehension target behaviour was WHEN and WHY questions (right/right). The second task experienced by Jacob was WHAT and WHERE questions (wrong/right).

Right/right. For the first task, WHEN and WHY questions, Figure 4 (first tier) shows that in the five baseline probes (unfilled circles), correct responding increased from zero to two correct responses and then decreased to zero correct responses (Sessions 1-4, and 9). In the two baseline generalisation probes conducted by the experimenter (unfilled squares) firstly in the dining room (Session 5) and secondly in the living room (Session 7) no correct responses were scored. In the two baseline generalisation probes conducted by Jacob’s father (unfilled diamonds), firstly in the dining room (Session 6) and secondly in the living room (Session 8) no correct responses were scored.

Figure 4. Number of correct responses across baseline sessions, video modelling treatment sessions, generalisation probes, and maintenance probes for Jacob plotted against session numbers. Unfilled circles depict baseline probes where no feedback was delivered; unfilled squares depict baseline generalisation probes conducted by the experimenter where no feedback was delivered; unfilled diamonds represent baseline generalisation probes conducted by Jacob's father where no feedback was delivered; filled circles depict training sessions and maintenance probes where feedback was delivered; filled squares depict generalisation probes conducted by the experimenter where feedback was delivered; and filled diamonds represent generalisation probes conducted by Jacob's father where feedback was delivered. Vertical arrows symbolise sessions where the video was viewed prior to testing for skill acquisition.


Baseline
Video modelling treatment
Maintenance
Oral comprehension
WHEN and WHY
Questions
randomly mixed
Jacob
Right/Right
Oral comprehension
WHAT and WHERE
Questions
randomly mixed
Jacob
Wrong/Right
Conversational reciprocity
Reciprocal statements
Jacob
Right/Right
Conversational reciprocity
Reciprocal questions
Jacob
Wrong/Right
Number of correct responses
Sessions

When the video modelling treatment was introduced Jacob received feedback (filled circles) for correct responses. Figure 4 shows an increased trend in correct responding for 15 sessions. After eight presentations of the right/right videos, criterion was reached (all eight responses correct over two consecutive sessions).

Criterion was not reached in the generalisation probes across settings, people and stimuli. The first five generalisation probes (Sessions 28, 29, 30, 32, and 34) shown in Figure 4 were conducted by the experimenter (filled squares) where variable responding between two and three correct responses are shown. Generalisation probes shown in Sessions 28 to 30 were conducted in the dining room and Sessions 32 and 34 were conducted in the living room. The four generalisation probes shown at Sessions 35, 36, 38 and 39 were conducted by Jacob's father (filled diamonds) where an increase to four correct responses for all probes are shown. Sessions 35 and 36 were conduced in the dining room and Sessions 38 and 39 were conducted in the living room.

When the order of WHEN and WHY questions were mixed in the maintenance probes (where the training stories were read) criterion was not met (Sessions 41-43). In the maintenance probes, on each occasion when the experimenter warned Jacob that the order of questions would be randomly mixed, Jacob responded with "Don't mix them up." Figure 4 shows initially six correct responses for two probes occurred which reduced to five correct responses for the last probe. In the final maintenance probe (Session 50), taken 1 week later, the questions were not mixed and Jacob responded with 100% accuracy.

Wrong/right. In the seven baseline probes (unfilled circles) for WHAT and WHERE questions, an increased trend is shown in Figure 4 (second tier) where between one and five correct responses were scored (Sessions 1, 2, 3, 10, 18, 21, and 24). An increase from three to four correct responses occurred in the four baseline generalisation probes (unfilled squares) conducted by the experimenter (Sessions 13, 16, 20, and 23). Sessions 13 and 23 were conducted in the dining room, and Sessions 16 and 20 were conducted in the living room. An increase from four to five correct responses occurred in the three baseline generalisation probes (unfilled diamonds) conducted by Jacob's father (Sessions 17, 19, and 22). Session 17 was conducted in

the dining room and Sessions 19 and 22 were conducted in the living room. Responding stabilised at between four and five correct responses and the video modelling treatment was introduced.

When the video modelling treatment began feedback was delivered (filled circles) and Figure 4 shows between six and eight correct responses occurred over five training sessions at which time criterion was reached (Sessions 25-29). Three presentations of the wrong/right videos were required to reach criterion (all eight correct responses over two consecutive sessions).

In the generalisation probes, an increased trend is shown. The experimenter conducted the first three generalisation probes (filled squares) in the dining room (Sessions 33 to 35), where an increase from six to seven correct responses occurred. Criterion was reached in the three generalisation probes conducted by Jacob's father (filled diamonds) in the dining room (Sessions 38 to 40). The two generalisation probes shown at Sessions 41 and 42 of Figure 4 were conducted by the experimenter (filled squares) in the living room where criterion was reached. The last two generalisation probes shown at Sessions 43 and 45 were conducted by Jacob's father (filled diamonds) in the living room where criterion was reached. Criterion was reached in the maintenance probes (filled circles) both when the WHAT and WHERE questions were mixed (Sessions 47, 48, and 50), and when they were not (Session 58).

Complaints

Jacob did not complain on any occasion about the requirement to watch the videos repeatedly nor did he complain about the tasks.

Response Generalisation

Right/right. For the WHEN and WHY task no incorrect responses occurred which were correct responses for any of the questions in the WHAT and WHERE task.

Wrong/right. For the WHAT and WHERE task no incorrect responses occurred which were correct responses for any of the questions in the WHEN and

WHY task. However, when the video modelling treatment was introduced for WHEN and WHY questions and correct responses increased for that task, correct responses increased in the baseline phase of the WHAT and WHERE task (See Figure 4).

Evidence of the Effectiveness of Video Training.

Right/right. For the WHEN and WHY task, when the video modelling treatment began 29 incorrect baseline responses (of a possible 80 opportunities to respond) were repeated by Jacob until Session 19 (Sessions, 10-16, and 19). Criterion was reached five sessions later.

Wrong/right. For the WHAT and WHERE task, when the video modelling treatment began only one baseline response was repeated by Jacob in Session 27. This incorrect response was not demonstrated as incorrect on the wrong-way video. No responses demonstrated in the wrong-way video were repeated by Jacob.

Conversational Reciprocity

The first task experienced by Jacob in the conversational reciprocity target behaviour was reciprocal statements (right/right). The second task experienced by Jacob was reciprocal questions (wrong/right).

Right/right. For reciprocal statements, Jacob responded with one reciprocal statement in one of the five baseline probes (unfilled circles). In the other four baseline probes no correct responses were scored. No correct responses were scored in the two baseline generalisation probes conducted by the experimenter (unfilled squares), firstly in the dining room (Session 25) and secondly in the living room (Session 27). No correct responses occurred in the two baseline generalisation probes conducted by Jacob's father (unfilled diamonds) firstly in the living room (Session 28) and secondly in the dining room (Session 29).

When the video modelling treatment began Jacob received feedback (filled circles). Figure 4 shows that after the initial two presentations of the right/right videos Jacob responded correctly for all 10 statements on two successive occasions. Criterion was reached.

Figure 4 (third tier) shows an increased trend in correct responding in the generalisation probes. For the first set of three probes conducted by the experimenter (filled squares) in the dining room (Sessions 37-39), nine correct responses decreasing to eight correct responses occurred. The next three probes (Sessions 40-42) were conducted by Jacob's father (filled diamonds) in the dining room where variable responding occurred and between eight and ten correct responses are shown. The following four probes (Sessions 43-46), conducted firstly by the experimenter (filled squares), and secondly by Jacob's father (filled diamonds), both in the living room, show criterion was reached. Criterion was also reached in the maintenance probe (Session 50).

Wrong/right. For reciprocal questions no correct responses were recorded in the six baseline probes (unfilled circles). No correct responses occurred in either of the two baseline generalisation probes conducted by the experimenter (unfilled squares) firstly at Session 31 in the dining room and secondly at Session 32 in the living room. No correct responses occurred in either of the two baseline generalisation probes conducted by Jacob's father (unfilled diamonds) firstly at Session 34 in the living room and secondly at Session 35 in the dining room.

When the video modelling treatment began, feedback was delivered (filled circles). Figure 4 (fourth tier) shows that after the initial two presentations of the wrong/right videos, Jacob responded correctly for the 10 reciprocal questions on two successive occasions. Criterion was reached.

The first three generalisation probes (Sessions 41-43) were conducted by the experimenter (filled squares) in the dining room where criterion was reached. The two generalisation probes shown at Sessions 44 and 45 were conducted by the experimenter (filled squares) in the living room where criterion was met. The four generalisation probes shown firstly at Sessions 46 and 47 were conducted by Jacob's father (filled diamonds) in the living room where criterion was reached, and secondly at Sessions 48 and 49 in the dining room where criterion was reached.. Criterion was reached in the maintenance probe (Session 58).

Complaints

Jacob did not complain on any occasion about the requirement to watch the videos repeatedly nor did he complain about the tasks.

Response Generalisation

Right/right. For the reciprocal statements task no incorrect responses occurred which were correct responses in the reciprocal questions task.

Wrong/right. For the reciprocal questions task no incorrect responses occurred which were correct responses for the reciprocal statements task.

Evidence of the Effectiveness of Video Training.

Right/right. For the reciprocal statements task, when the video modelling treatment began no incorrect baseline responses were repeated by Jacob.

Wrong/right. For the reciprocal questions task, when the video modelling treatment began no incorrect baseline responses were repeated by Jacob, including those which were demonstrated as incorrect on the wrong way video.

Unequal Numbers of Negative and Positive Cues Assigned to each Condition in Interested/Bored and Good Conversation Tasks

For two target behaviours (good conversation, interested/bored) opportunities to identify positive and negative cues were unequal in each condition for 4 participants (Jack, Paul, Zac, and Frances). That is, two positive cues and one negative cue were assigned to one condition, while two negative cues and one positive cue was assigned to the other condition. Table 4 shows that negative cues were identified more frequently than positive cues in the interested/bored and good conversation tasks.

Summary

Overall, from the data shown in Figures 1-4, neither the right/right modelling condition nor wrong/right modelling condition resulted in faster acquisition and

Table 4

Percent of Positive Cues, and Negative Cues Identified Correctly per Condition for each Participant in the Interested/Bored and Good Conversation Tasks

Participant	Wrong/Right						Right/Right					
	Negative			Positive			Negative			Positive		
	No.of cues	No. of opport-unities	% correct	No. of cues	No. of opport-unities	% correct	No. of cues	No. of opport-unities	% correct	No. of cues	No. of opport-unities	% correct
Interested/ Bored												
Matthew							3	75	89	3	75	37
Jack	1	13	46	2	26	23	2	28	32	1	14	21
Paul	2	34	47	1	17	29	1	15	53	2	30	47
Good Conversation												
Matthew	3	78	51	3	78	14						
Zac	2	56	50	1	28	36	1	28	46	2	56	48
Frances	1	21	19	2	42	0	2	50	66	1	25	12

Note. Jack experienced the modified error and correction task

superior generalisation. For Frances (good conversation), Matthew (conversation cue discrimination), and Paul (interested/bored), the right/right video modelling treatment led to faster skill acquisition. For Zac (good conversation), the wrong/right video modelling condition led to faster skill acquisition. For Jacob, in oral comprehension, response generalisation occurred in the baseline phase for the wrong/right modelling condition and hence any comparison between conditions is compromised. For Jacob, in conversational reciprocity no difference in speed of skill acquisition occurred in either condition.

For Jack in manners (eye-contact) and interested/bored, the video modelling treatment was abandoned because Jack refused to watch the videos. For Jack in manners (correct response to coughing), and Frances in turn-taking criterion was not reached and at the end of training no gains were made. Additionally for Brian, in road safety, criterion was not reached in either modelling treatment condition, however where gains were made, only small differences in acquisition rate occurred between the conditions. In addition, Brian began imitating the wrong-way video model in the ball retrieval task. Table 5 sets out for each participant the number of video presentations required to reach criterion in the right/right and wrong/right modelling conditions.

Overall, for generalisation and maintenance of the skills, when criterion was achieved in both conditions, only small differences, if any, between conditions was shown. Further, where criterion was reached in one condition only, generalisation and maintenance were superior for that condition compared with the other condition. Table 6 sets out for each participant the number of correct responses in the generalisation probes (where testing occurred) for each of the right/right and wrong/right modelling conditions.

Interobserver Reliability

A second trained observer viewed the videotapes of the sessions for 30% of the total data. A total of 431 data points are shown in Figures 1-4 and the second observer scored correct and incorrect responses/behaviour targets using the same criteria the experimenter used, for 129 of the 431 data points. Sessions observed

Table 5

Number of Video Presentations and Training Sessions Required to Reach Criterion for each Participant for each Task in each Condition

Participant	Target behaviour	Condition in first order	No of video presentations	
			Right/Right	Wrong/Right
Matthew	Conversation cue discrimination	Right/Right	8 (16 sessions)	No criterion after 10 video presentations (16 sessions)
Zac	Good conversation	Wrong/Right	No criterion after 9 video presentations (17 sessions)	9 (17 sessions)
Jack	Manners	Right/Right	No criterion after 8 video presentations (13 sessions)	Withdrawal
	Interested/bored	Wrong/Right	Withdrawal	Withdrawal
Paul	Interested/bored	Wrong/Right	3 (4 sessions)	4 (6 sessions)
Frances	Turn-taking	Right/Right	No criterion after 8 video presentations (13 sessions)	
	Good conversation	Wrong/Right	7 (12 sessions)	No criterion after 8 video presentations (13 sessions)
Brian	Road safety	Wrong/Right	No criterion after 7 video presentations (12 sessions)	No criterion after 7 video presentations (12 sessions)
Jacob	Oral comprehension	Right/Right	8 (15 sessions)	3 (5 sessions)
	Conversational reciprocity	Right/Right	2 (2 sessions)	2 (2 sessions)

Table 6

The Number of Correct Responses and the Total Number of Targets for each Participant in the Generalisation Probes for each Condition

Participant	Target behaviour	Condition in first order	Right/Right	Wrong/Right
Matthew	Conversation cue discrimination	Right/Right	4/6	2/6
Zac	Good conversation	Wrong/Right	2/3	2/3
Jack	Manners	Right/Right	Not tested	Not tested
	Interested/bored	Wrong/Right	Not tested	Not tested
Paul	Interested/bored	Wrong/Right	3/3	3/3
Frances	Turn-taking	Right/Right	0/3	
	Good conversation	Wrong/Right	2/3	0/3
Brian	Road safety	Wrong/Right	Not tested	Not tested
Jacob	Oral comprehension	Right/Right	4/8	8/8
	Conversational reciprocity	Right/Right	10/10	10/10

were randomly selected across all experimental phases. Generally, for each participant, and each task in each condition interobserver agreement was obtained for at least one baseline probe, one baseline generalisation probe, two training sessions, two generalisation probes and one maintenance probe.

Interobserver agreement was calculated for each task in each observed session by dividing the total number of agreements by the total number of agreements and disagreements and multiplying by 100 (Cooper et al., 2007). Results are set out in Table 7. Mean interobserver agreement ranged from 75% to 100%. Overall, the mean interobserver agreement across all observations was 98.6%.

Cue Fidelity

A second trained observer viewed the videotapes of the sessions for 29% of the total data. A total of 219 data points are shown in Figures 1-4 for the good conversation and interested/bored target behaviours/tasks and the second observer was required to identify the cue presented by the experimenter and then score agreement or disagreement for 64 of those data points. That is, that the cue presented by the experimenter represented the cue it was intended to represent. For example, if the cue presented by the experimenter was nodding and smiling then the second observer scored whether she agreed or disagreed that the cue represented nodding and smiling. Sessions observed were randomly selected across all experimental phases. Generally, for each participant, and each task, in each condition, interobserver agreement was obtained for at least one baseline probe, one baseline generalisation probe, two training sessions, two generalisation probes and one maintenance probe.

Interobserver agreement was calculated for each task in each observed session by dividing the total number of agreements by the total number of agreements and disagreements and multiplying by 100 (Cooper et al., 2007). Results are set out in Table 8. Mean interobserver agreement ranged from 83.4% to 100%. Overall, the mean interobserver agreement across all observations was 97.8%.

Table 7

Range and Mean Percentage Interobserver Agreement on Target Behaviours by Participant, Target Behaviour, Condition and Experimental Phase

Participant		Condition							
		Right/Right				Wrong/Right			
		Baseline	Training	Generalisation	Maintenance	Baseline	Training	Generalisation	Maintenance
	No. of sessions observed	20	21	18	7	19	19	18	7
Matthew									
Conversation	Range							83.3-100	
cue discrimination	Mean	100	100	100	83.3	100	100	94.4	100
Zac	Range					66.7-100			
Good conversation	Mean	100	100	100	100	83.4	100	100	100
Jack	Range					50-100			
Manners	Mean	100	100			75	100		
Interested/bored	Range		66.7-100						
	Mean	100	83.4			100	100		
Paul	Range								
Interested/bored	Mean	100	100	100	100	100	100	100	100
Frances	Range								
Turn-taking	Mean	100	100	100					
Good conversation	Range	66.7-100							
	Mean	83.4	100	100	100	100	100	100	
Brian	Range								
Road safety	Mean	100	100			100	100		
Jacob	Range								
Oral comprehension	Mean	100	100	100	100	100	100	100	87.5
Conversational	Range								
reciprocity	Mean	100	100	100	100	100	100	100	100

Table 8

Range and Mean Percentage Interobserver Agreement on Experimenter Cues for Target Behaviours by Participant, Target Behaviour, Condition and Experimental Phase

		Condition							
		Right/Right				Wrong/Right			
Participant		Baseline	Training	Generalisation	Maintenance	Baseline	Training	Generalisation	Maintenance
	No. of sessions observed	10	11	7	4	9	11	9	3
Matthew									
Conversation	Range	83.3-100				75-83.3			
cue discrimination	Mean	91.7	100	100	100	79.2	100	100	100
Zac									
Good conversation	Range						66.7-100		
	Mean	100	100	100	100	100	83.4	100	100
Jack									
Interested/bored	Range								
	Mean	100	100			100	100		
Paul									
Interested/bored	Range								
	Mean	100	100	100	100	100	100	100	100
Frances									
Good conversation	Range						66.7-100		
	Mean	100	100	100	100	100	83.4	100	

Parent Satisfaction

All seven parents completed and returned the Parent Consumer Satisfaction Questionnaire (see Appendix U for copy). Teaching road safety skills continued for Brian following the research and Brian's mother completed the form when teaching ended.

Social Significance of the Behavioural Goal (i.e., skill taught)

Six parents reported that the social skill taught was 'very important,' and further that the social skill taught was 'very desirable' (i.e., one they wanted their child to learn). One parent (Paul's parents) thought the social skill was 'moderately important' and the social skill taught 'slightly desirable.'

Social Appropriateness of the Procedure

All seven parents considered that video modelling as a treatment procedure was 'very acceptable.' Six parents considered the length of treatment 'neither long nor short.' One parent (for Jacob) considered the length of treatment to be 'somewhat short.' Six parents felt they were 'very informed' throughout the procedure. One parent (for Paul) felt that they were 'moderately informed.'

Three parents (for Matthew, Paul and Jacob) reported that their children 'never' complained about the procedure. Three parents (for Zac, Jack, and Frances) reported that their children complained 'very infrequently' about the procedure. Frances' parents reported that Frances complained towards the end of the intervention. Brian's parent reported that Brian complained 'moderately infrequently.' Four parents (for Matthew, Paul, Frances, and Brian) reported that their children expressed feelings about the procedure that were 'very positive.' Three parents (for Zac, Jack, and Jacob) reported that their children, expressed feelings that were 'moderately positive.'

Social Importance of the Treatment Outcomes

Six parents reported they were 'very satisfied' with the results as graphically depicted and reported to them. One parent (Frances' parents) reported they were

'moderately satisfied.' All seven parents observed positive behaviour changes in their child. Matthew's parents reported that he was coping better at home. Zac's parents reported that Zac sometimes "thinks out loud" relative to the cues shown in the videos. They further reported that he began asking questions about conversation cues, and waited instead of 'butting in,' in conversation. Jack's parents advised, with regard to the interested/bored target behaviour that Jack showed improvement in reading cues in others. They commented that despite there being no change in behaviour for the manners tasks, many attempts had been made to change these behaviours without success. Jacob's parents reported that Jacob "is now able to initiate conversation and stay in conversation for a short period of time." Paul's parents reported that Paul was now aware when his mother was not paying attention to him (when he spoke to her), and became upset. Frances' parents reported that Frances showed an interest in what her mother had been doing by asking questions, and reported her relationship with her peers at school had improved. Brian's parents reported that Brian had an ability to understand: roads (when he needed to hold hands); cars on the road; stopping; when to walk; and when to wait.

Three parents reported that others did not report any behaviour changes. Four parents reported that others made comments regarding behaviour changes. Matthew's parents advised that his teacher reported a positive change in Matthew's interactions with herself and other students. Furthermore, she reported that Matthew was no longer interrupting the teacher or classmates, was able to recognise when others were interested in what he had to say, was able to maintain interesting conversations with others, and Matthew reported to her that he no longer felt bullied. Zac's parents reported that a neighbour commented to them that Zac asked more questions in conversation after the modelling treatment began. Jack's parents advised that at the same time as the video intervention occurred, one of Jack's teachers reported a 'surge' in motivation to do well. Jack's parents commented that in order to do well, he was required to attend to the teacher's instructions which they considered the video intervention assisted with. Brian's mother reported that his therapy team noticed a change in awareness concerning the behaviour changes that were reported (above).

Three parents (for Brian, Matthew, and Jack) considered the behaviour changes 'very satisfactory.' Four parents (for Zac, Frances, Paul, and Jacob) considered the behaviour changes (i.e., whether they were positive) to be 'moderately satisfactory.' Five parents considered the behaviour changes to be 'very important,' and two parents (Zac and Paul) considered the behaviour changes to be 'moderately important.'

Five parents did not observe any unpredicted behaviour changes (i.e., changes in behaviours that were not targeted in the intervention). Zac's parents reported that Zac reminded them of some of the rules he had learnt (i.e., pointed out their conversational mistakes). Zac's parents considered this unpredicted behaviour change to be 'moderately satisfactory' and 'moderately unimportant.' Matthew's parents reported that he was now able to cope with choices others made when they ended a conversation with him (i.e., did not now mean they were being mean or did not like him). Matthew's parents considered these behaviour changes to be 'very satisfactory' and 'very important.'

Four parents (Matthew, Jack, Jacob, and Brian) reported that acquisition was 'very beneficial.' Three parents (for Zac, Paul, and Frances) reported that acquisition of the skills for their child was 'moderately beneficial.'

Overall Intervention

Five parents reported that overall, the intervention was 'very helpful,' and two parents (for Frances and Paul) reported the intervention was 'moderately helpful.' Six parents were 'very satisfied' overall with the intervention, and one parent (for Jacob) was 'moderately satisfied.' Six parents reported they would 'strongly recommend' the intervention to a friend or relative while Jacob's parents reported they would 'moderately recommend' the intervention to a friend or relative.

Parents' Comments

Paul's parents commented that they would use video modelling to teach Paul other skills. Jack's parents commented that if Jack had received feedback in addition of the video modelling treatment, they considered the intervention would have been

strengthened. Frances' parents commented that increased benefits for their child may have occurred if the process was positively reinforced and also used by them, as parents, at home. Frances' parents also commented that if Frances had been informed that the intervention would help her to "make, have and get along with friends," it may have helped Frances with her motivation during the intervention, as having friends was an outcome that Frances desired.

DISCUSSION

The main purpose of this study was to further the research in video modelling with children diagnosed with ASD, by investigating which of two methods (i.e., demonstration of a task using one exemplar of the wrong way and one exemplar of the right way (wrong/right); or two different exemplars of the right way (right/right)), would result in faster acquisition, and/or superior generalisation of a skill taught. Overall, neither the wrong/right video exemplars, nor the right/right video exemplars resulted in faster acquisition and/or superior generalisation.

A subsidiary aim of this study was to determine whether narration of the modelling videos was necessary for skill acquisition. Overall, narration did not increase target behaviours.

Interobserver Agreement and Cue Fidelity

In general, the mean interobserver agreement across all observations was high, as was reliability of the independent variable (over 97% in both cases).

Table 7 shows a range of 50% to 100% agreement for Jack in the manners task. The lower range may lessen the believability of the data set (Cooper et al., 2007), however, for the current data set most tasks comprised only two or three target behaviours. Hence, one agreement and one disagreement reduces the per cent agreement to 50. In the same way, where 66.7% is shown in Tables 7 and 8, it represents two agreements and one disagreement in tasks comprising three target behaviours. Accordingly, the lower ranges recorded in Tables 7 and 8 should not pose any concern for reliability of the data in the current study.

Acquisition

In this study, neither the wrong/right nor the right/right modelling condition was superior in acquisition of the target behaviours. Many confounds, however, arising over the course of the study may have contributed to the equivocal nature of the findings. As a result little can be drawn from the findings and therefore comparison with findings from the group studies where positive exemplars were

compared with a combination of positive and negative exemplars would prove unproductive. Notwithstanding that, comparison with those studies was always limited given that they used group designs with young adults with normal development whereas single case designs with children with ASD were utilised in this study. No other studies testing wrong/right exemplars and right/right exemplars in video modelling with children with ASD have been reported in the literature.

In addition, these findings should be treated with caution given that criterion was not reached for seven of the nineteen tasks.

Criterion

In this study criterion was reached for only nine of the nineteen tasks. For three of the nineteen tasks, withdrawal occurred prior to the end of training and for one task withdrawal occurred at the end of training (i.e., generalisation and maintenance were not tested). Given that criterion was not reached for seven tasks (excluding tasks where withdrawal occurred prior to the end of training) a closer inspection of the video modelling literature is warranted to examine the explanations given in other studies for acquisition failure.

In other studies, a criterion was not always set for participants, but instead increases in target behaviours from baseline performance were reported. In this study, for an additional four tasks where criterion was not reached, participants also showed increases in target behaviours from baseline performance. Thus, in the present study, it could be reported that where participants completed training, video modelling was successful for 13 of the 16 tasks. Like the current study, some studies also report failure for some participants/tasks.

In the study by Sherer et al. (2001) 2 (1 participant was not autistic) of the 5 participants did not reach criterion. That is, for a total of ten tasks, criterion was not reached for five of them (i.e., half). They reported all participants were matched for language ability and IQ and suggested the 2 participants failed because their visual learning ability was limited compared with the participants who reached criterion.

In the Nikopoulos and Keenan (2003) study, 3 of the 7 participants did not increase social initiations. That is, for three of the seven tasks, target behaviours did

not increase. The authors attributed this failure to disruptive behaviours which interfered with attendance to the videos; restricted non-verbal imitative repertoires, and to a deficit in play skills.

In the in-vivo study by Jahr et al. (2000) the 4 participants who were required to imitate the video made no gains (i.e., imitation only condition). That is, criterion was not reached in four of the six tasks. When these 4 participants were required to firstly, describe the video correctly and secondly, to imitate the video, they all acquired co-operative play to criterion as did the 2 other participants who were assigned to this condition (i.e., verbal description and imitation condition). The authors attributed success to the verbal description component, and suggested that it may have assisted participants to discriminate the components comprised in the video.

The above studies are particularly relevant to this study because they were also comparatively large studies involving 5 or more participants. Delano (2007a) reported that most studies in the video modelling literature comprised fewer than 4 participants. For the present study, initially results were disappointing, however after reviewing the literature as to lack of participant gains, results are not untypical of what has been reported in other large studies.

Some video modelling studies (some published after the current study began) involving fewer than 5 participants also cite failures. For example, in the Apple et al. (2005) study an additional component, a verbal contract with tangible reinforcement, was required before each of the two participants initiated compliments.

Maione and Mirenda (2006) reported failure of video modelling alone to achieve increases in language use with the single participant in their study. The addition of prompting, and video feedback (getting child to watch the video and name instances of ‘good talking’ and ‘not good talking’) were required to increase language use for one of the tasks. The authors attributed failure to perseverative behaviours (e.g., spinning the wheels of the toy car).

In the Sansosti and Powell-Smith (2008) study, 2 of the 3 participants required modifications (i.e., addition of teacher prompts) to the social story and video modelling intervention before positive gains were seen. In addition, Sansosti and

Powell-Smith suggested that delivery of reinforcement for correct target behaviours may be required for some participants in order for gains to be made.

Scattone (2008) reported gains for two of the three behaviours targeted for improvement for the single participant in the study. Scattone attributed failure to task difficulty (i.e., increasing smiling was difficult for the participant).

In the Alcantara (1994) study the addition of in-vivo prompts and reinforcement were required for criterion performance in grocery-purchasing skills by all 3 participants in the study.

Thus, it has been shown above that failures have occurred in large and in small studies.

The Effect of Narration on Acquisition

Generally, in this study, the video introductions (i.e., narration) did not influence production of target behaviours in the task-type modelling (i.e., manners, turn-taking, and road safety). That is, generally, the targeted behaviours were not imitated following the presentation of the video introductions. This is inconsistent with the group study completed by Bashman and Treadwell (1995). They found for 99 college students who viewed a training video in psychodrama that the group who viewed the video with narration learned more group-action techniques compared with the groups who did not receive the narration. However, the post-measure in that study (i.e., multiple choice test) was not equivalent to the post-measure in the current study (i.e., actual behaviour change). So, direct comparison between the studies is not possible.

In the current study, at the end of training, when the participants in the task-type modelling (i.e., Frances, Jack and Brian) were asked to describe the videos, both Frances and Jack (for turn-taking and response to coughing) were able to verbalise what the videos were designed to teach. What is not clear is whether they possessed this knowledge prior to the intervention or whether the videos provided the knowledge. In hindsight, it is now clear that a pre-intervention measure would have made this obvious. However, Bashman and Treadwell (1995) whose study was the model for the narration component in this study, did not administer a pre-intervention

measure. The study by Bashman and Treadwell (1995) was a group design and the current study was a single case design. Accordingly, the single case designs in the current study made the need for a pre-intervention measure apparent because individual outcomes were sought and reported, whereas in group designs general outcomes are sought and reported.

Future studies should consider the administration of a pre-intervention measure as discovering that the participants possessed the knowledge but did not emit the target behaviours would lead to other explanations (e.g., complexity of behaviour sequences, non-compliance, other variables influenced behaviour (e.g., reinforcer dimensions)) and may assist in planning successful interventions.

Brian's unprompted descriptions of the videos were of a general nature (i.e., "I see the boy cross the road," "I see a truck and a bus and a car"). That is, he did not provide information relating to the actions required to retrieve the ball and cross the road safely (e.g., look both ways). This may indicate that the videos were too complex for Brian (e.g., contained too many steps and too much verbal information), or like the Scattone (2007) study, the task was too difficult. Brian did not reach criterion in either condition and may have benefited from a requirement to describe the videos correctly prior to imitation. This requirement proved successful for participants in the Jahr et al. (2000) study.

Unfortunately, the study by Bashman and Treadwell (1995), did not elaborate on how the narration was presented in their study (e.g., interspersed throughout, at the beginning or end of each training target). In the present study, the full narration of the videos was contained in a separate video which was viewed prior to the modelling videos. That is, the narration was not contained within the video exemplars. Accordingly, a comparison with the Bashman and Treadwell study cannot be made, but presentation differences may have contributed to the lack of success in this study, compared with the success in the Bashman and Treadwell (1995) study. More particularly, narration was considered to produce behaviour change because it made specific segments (i.e., behaviour targets) salient (Coyle & Cole, 2004). In this study the separate video narration may have failed to make the behaviour targets salient. Like the current study, the instructional rules in the study by Apple et al. (2005) were

not sufficient to produce compliment-giving initiations. Unlike the current study, the narrative in the Apple et al. study was viewed after the modelling segment. Future studies may wish to manipulate narration placement (i.e., interspersed, beginning, end) as the independent variable to determine which placement is more effective.

Generalisation

Baldwin (1992) found that the use of positive and negative exemplars resulted in superior generalisation for 72 university students in an assertive communication training course compared with the use of multiple exemplars, and with the use of positive exemplars only.

The findings in the current study do not support Baldwin's findings. Generally, when criterion was reached in a condition, then generalisation was superior for that condition, compared with the other condition. Otherwise, the use of positive and negative exemplars did not result in superior generalisation, nor did their use result in inferior generalisation. Therefore, neither the wrong/right nor the right/right modelling conditions contributed to superior generalisation in this study. Bellini and Akullian (2007) reported that skills trained to mastery (100% correct) achieved higher generalisation (and maintenance) effects compared with skills that were not trained to mastery. Thus, the findings for the current study are unsurprising, in that where increases in target behaviours were achieved in a condition some generalisation was achieved regardless of the condition (i.e., wrong/right, right/right). Researchers from the video modelling literature with the ASD population (e.g., Charlop & Milstein, 1989; Corbett, 2003; Hine & Wolery, 2006) attributed successful generalisation to the use of multiple exemplars. For the current study, it may be that the use of multiple exemplars were sufficient (regardless of whether one exemplar was negative and one positive, or both were positive) to enhance generalisation for the population used in the current study.

Maintenance

For those video modelling studies where maintenance was tested, it has been reported that acquired skills were maintained (Delano, 2007a). In the current study

where maintenance of the target behaviours was tested, generally superior maintenance was achieved in the condition (either wrong/right or right/right) where criterion was reached, compared with the other condition. Generally, where criterion was reached in both conditions no differences in maintenance of the target behaviours occurred between the conditions. Therefore, maintenance of the target behaviours was not consistently better for either the wrong/right or right/right modelling conditions.

The general findings for this study are reasonably intuitive in that where inferior performance occurred in a condition, inferior maintenance occurred regardless of the condition, but where superior performance occurred in a condition, superior maintenance was achieved regardless of the condition.

Possible Confounds and Threats to Validity

Several confounds may have interfered with the findings in this study. Some confounds were common across some, but not all participants, and some were unique to a single participant.

Generalisation across Tasks

This study had some instances of response generalisation. That is, the acquisition of one behaviour caused the occurrence of an untreated behaviour (Bailey & Burch, 2002). Most previous studies did not find generalisation, or at least did not report it. Bailey and Burch (2002) state that generalisation (i.e., that a treatment will affect another baseline) is potentially problematic when using multiple baseline designs. They state that when it occurs, it is difficult to ascertain whether the intervention or another variable was responsible for any behaviour change.

In the current study, some response generalisation across tasks occurred for all but three target behaviours (Frances (good conversation), Jack (manners), and Jacob (conversational reciprocity). Some target behaviours (i.e., good conversation, interested/bored, oral comprehension) comprised a molar behaviour (i.e., main category) divided into two sub-categories (e.g., three cues in each of the two conditions). This is a common strategy in multiple baseline designs to ensure that the

behaviours across conditions are independent but functionally similar, and require equal effort to perform (Bailey & Burch, 2002). That is, it ensures that conditions are equally matched in level of difficulty. However, this strategy may also make response generalisation more likely.

Response generalisation across tasks was more salient and problematic for Jacob (oral comprehension). Following the introduction of the video modelling treatment for the task assigned to the first-ordered condition, Jacob's performance improved in the baseline phase for the task assigned to the second-ordered condition (see Figure 4).

Charlop-Christy et al. (2000) did not report generalisation for the participant who completed the same target behaviour (oral comprehension) in their study, however as they point out the time-lag between the first and second condition was short. That is, following the introduction of the modelling treatment for the first condition, only one further baseline probe was taken in the second condition prior to the introduction of the modelling treatment for that condition. Accordingly, there was no opportunity to see any effects of generalisation. In the current study, the baseline phase for the second condition was sufficiently long which afforded the opportunity to see response generalisation. Therefore, because of the differences in the time-lags between conditions, a comparison between studies cannot be made.

Unfortunately when generalisation occurs any results obtained are unusable (Bailey & Burch, 2002). Accordingly, for the current study, it seems that little can be drawn from the results obtained for the oral comprehension target behaviour for Jacob.

Inequivalence of Task Difficulty across Conditions

Task difficulty may not have been equivalent across tasks in the interested/bored, good conversation, and oral comprehension target behaviours.

Positive versus negative cues. For both the good conversation and the interested/bored target behaviours/tasks, for nine of ten tasks, participants in the present study, identified negative cues correctly (e.g., talking in monologue fashion) more often than positive cues (e.g., turn-taking). This bias was not problematic for

Matthew (conversation cue discrimination) because equal numbers of positive and negative cues (three each) were assigned to each of the tasks. Additionally, it was not problematic for Jack because the interested/bored target behaviour was modified from video modelling to an error and correction task (i.e., withdrawal occurred). However, the bias towards identifying negative cues correctly, is a potential confound for the remaining three participants who completed the interested/bored or good conversation tasks (Zac, Frances, and Paul), because one condition contained two negative cues and one positive cue (e.g., no eye-contact, walked away, nodded and smiled) while the other condition contained two positive cues and one negative cue (e.g., asked a question, eye-contact, sighed).

Accordingly, a prediction could be made that a participant's performance would be superior in the condition where two negative cues and one positive cue were assigned. This prediction holds for two (Frances, and Zac) of the three participants. That is, where two negative cues and one positive cue were assigned to a condition performance was superior in that condition. It does not hold for Paul because his performance was slightly superior in the condition (right/right) where two positive cues and one negative cue were assigned.

Thus, participant performance may not be attributed solely to the modelling condition (wrong/right, right/right). This was an unforeseen consequence and it appears from a literature review following the completion of this study, that no other studies have been completed testing differences in cue identification for negative and positive social cues. However, Jentsch, Bowers, and Salas (2001) found that air pilots recognised more negative exemplars of target behaviours than positive exemplars and suggested negative exemplars made the target behaviours more salient. For the current study, salience may have been increased for the negative cues which made them easier to recognise. That is, the positive cues may have been more subtle and therefore more difficult to identify. For example, looking away (bored cue) may be more obvious than making eye-contact (interested cue), or walking away (bored cue) more obvious than asking a question (interested cue). If this is the case, then the interventions (conditions) in this study were not equivalent. That is, task difficulty

was not matched in the conditions. So, comparison of the conditions may be compromised for three of the participants (Zac, Frances, and Paul).

Future studies would need to avoid this confound by ensuring that either, equal numbers of positive and negative cues are assigned to each condition, or only positive cues are used.

Oral comprehension. In the present data set WHEN and WHY questions appeared to be more difficult to learn compared with WHAT and WHERE questions. This corresponds with statements made by Freeman and Dake (1996). They state that children with language delays frequently find WH (e.g., when, where) questions difficult. Language delays are frequently reported in children with ASD (Lovaas, 2003). Though difficulty can vary from child to child, generally, the order of difficulty, from easiest to hardest, is WHAT, WHO, WHERE, WHEN, WHY and HOW (Freeman & Dake, 1996).

The oral comprehension target behaviour was a partial replication of the same target behaviour reported in the Charlop-Christy et al. (2000) study. Their participant appeared to have no difficulty with the WHEN and WHY questions compared with the WHAT and WHERE questions as the acquisition rate was equal (criterion was reached following two modelling presentations for both tasks). Jacob's difficulty with the WHEN and WHY questions may be further supported by Jacob's inability to achieve criterion in both the generalisation and maintenance probes for the task. In comparison (for Jacob) criterion in both sets of probes was achieved for the WHAT and WHERE questions which is in line with Freeman and Dake's (1996) proposed scale of difficulty.

Jacob achieved some generalisation in the WHEN and WHY questions, whereas the participant in the Charlop-Christy et al. (2000) study did not achieve any generalisation for the same questions, but generalised to criterion in the WHAT and WHERE questions. Charlop-Christy et al. attributed this lack of success to the in-vivo modelling condition as overall, inferior generalisation occurred in it compared with the video modelling condition. They suggested, among other things, that generalisation may have been promoted in the video modelling condition because video modelling is associated with television which is a common stimulus in other

environments; that children with autism may have a history of reciting or imitating segments from television programmes; and viewing a television screen (video modelling) creates an informal learning environment. These suggestions may be correct for the participant in the Charlop-Christy et al. study for two reasons. Firstly, their participant generalised in one condition only, and secondly, there was no difference in acquisition rate between conditions. Thus, it could be inferred that question difficulty was equally matched between conditions for their participant. However, this does not appear to be the case for Jacob in the current study. A confound may have existed in the way the questions were grouped. That is, when and why questions are considered the most difficult (Freeman & Dake, 1996) and were grouped together in one condition. What and where questions are considered relatively easy and were grouped together in the second condition. For Jacob, in the current study, the degree of difficulty associated with the questions, rather than the modelling condition, could have been responsible for the lack of generalisation to criterion.

This conclusion is further supported by Jacob's performance in the maintenance probes. Jacob did not achieve criterion when the WHEN and WHY questions were asked in random order but did when they were ordered as they were in training. This suggests that Jacob may have memorised the correct answers. Charlop-Christy et al. (2000) did not test for maintenance and hence a comparison with that study cannot be made.

Accordingly, for the present study, the lack of question matching may have further compromised comparison of the conditions (in addition to the response generalisation previously discussed). Future studies should ensure that the questions are matched in difficulty (e.g., group when and where questions together in one condition and why and what questions in the other condition).

Models

A confound may have existed for Matthew as it became known at the first video presentation (in the first condition) that the models were his friends. This was co-incidental and unforeseen. Any comparison of conditions is therefore

compromised as this may have contributed to Matthew's superior performance in the first condition. That is, these models may have exerted more influence than the models who were unknown to Matthew and used in the second condition.

Settings

This study was conducted either, in a room in a participant's house for all sessions (Zac, Jack, Brian and Jacob), or a room at a participant's school for all sessions (Matthew, Frances, Paul). Hersen et al. (2009) state that for multiple baseline designs across participants, environmental conditions should be identical. Given that a room was used in both settings, it was considered to make the experimental settings identical. However, in the home settings, because of the open plan nature of the participants' homes, family members were sometimes present in an adjoining open plan room. Accordingly, it is unknown what influence the presence of family members had on a participant's performance. In the school settings, no family members or other people were present during the sessions. If the presence of family members had an effect on participant performance then the experimental settings were not equal. This was unforeseen in the planning for this study. Future studies may wish to avoid this possible confound.

Complaints

The complaints made by some participants may have been indicative of a lack of reinforcers.

For the conversation-type modelling, when the video modelling treatment commenced, initially Matthew, Frances, and Jack did not receive feedback (potentially reinforcing) for responses (conversation cue discrimination, good conversation, interested/bored respectively). These participants all complained about the tasks and the requirement to view the videos repeatedly.

Bol and Steinhauer (1990) and Deguchi, Fujita, and Sato (1988) suggest that when observers see a model's behaviour reinforced but their imitation is not reinforced, it amounts to extinction. More particularly, Bol and Steinhauer found in a group study with kindergarten participants, that when one observer participant saw an

in-vivo model gain reinforcement following the completion of a puzzle, but (observer) did not gain reinforcement following the completion of a matched puzzle, the observer participant's performance decreased. In addition, Bol and Steinhauer reported that complaints and aggression increased in the observer participants. Some of the complaints were like the complaints made by the participants in the current study. For example, observer participants in the Bol and Steinhauer (1990) study said "I don't want to do these," "Why do you only cheer for him and not for me" (p.588). Thus, for the current study, extinction may have resulted, but extinction was not intended (i.e., inadvertent) for the current study.

In another study, Deguchi et al. (1988) found that pre-school participants who observed a video model gain reinforcement for a target behaviour but did not themselves gain reinforcement for the same target behaviour, initially imitated the video model but decreased imitation (sometimes suddenly) over time. Moreover, Deguchi et al. reported imitation decreased over time for participants who experienced a simple modelling procedure where neither video model nor participant gained reinforcement for correct responses. In the reversal design used, when direct reinforcement was delivered for (observer) imitation, imitation increased. Thus, direct reinforcement was necessary for imitation to be maintained (Deguchi et al., 1988). It was suggested that where a reinforcement effect was found in previous studies in vicarious reinforcement (social learning framework) effects were only measured for short periods (e.g., 10 min, over one or two sessions) (Bol & Steinhauer, 1990; Deguchi et al., 1988). Deguchi et al. (1988) suggest that imitation can be maintained by intermittent reinforcement and because intermittent reinforcement is resistant to extinction, imitation in the vicarious reinforcement studies was probably maintained for a short period without direct reinforcement (i.e., measurement of effects was too short for extinction effects to be seen). Thus, affording Bandura's claim that direct (extrinsic) reinforcement was unnecessary (Deguchi et al., 1988). Studies in both basic research (e.g., Azrin, Hutchinson, & Hake, 1966) and applied research (e,g, Lerman, Iwata, & Wallace,1999) have documented increases in aggression following operant extinction.

The findings in the current study support the findings in the Bol and Steinhauer (1990) and Deguchi et al. (1988) studies. Collectively, the findings have important implications for vicarious reinforcement procedures. That is, vicarious reinforcement may not succeed in increasing target behaviours and may instead be aversive producing escape and aggression (Bol & Steinhauer, 1990). In the current study, when feedback was not delivered, a decrease in correct responding was most noticeable for Matthew (see Figure 1), while complaints were made by all three (Matthew, Jack, Frances) participants. However interestingly, no other studies in the video modelling literature with children with ASD have reported extinction effects (i.e., decreased responding, complaints, aggression, escape) when direct reinforcement for imitation was not delivered. One possible explanation may be as Lovaas (2003) suggests that some children with autism may be delayed in acquiring secondary reinforcers (e.g., social praise, feedback for correct answers) and so the absence of secondary reinforcers had no effect on their performance. For the current study, Matthew, Jack, and Frances were aged 10, 15, and 8 years respectively and it is likely that secondary reinforcers have been well conditioned by this age (and) for children attending regular classrooms.

All participants received intermittent non-contingent reinforcement (e.g., praise for being on task, completing the task) throughout the sessions, however this praise was not sufficient to prevent their complaints.

The other participants in the conversation-type modelling (Zac, Paul, and Jacob) received feedback when the video modelling treatment began and made no complaints about the tasks or the requirement to view the videos repeatedly.

The findings suggest that the vicarious reinforcement procedure (i.e., without direct reinforcement) in the present study was effectively extinction. Therefore, the lack of feedback in this study may have been an aversive event, which in turn gave rise to complaints.

Moreover, the lack of feedback following responses for Matthew, Jack, and Frances may have had a negative impact on the study. More particularly, Jack withdrew, while as already mentioned for Matthew correct responses decreased, and

for Frances, the data set for the good conversation 2 task shows an increase in correct responding following delivery of feedback for correct responses (see Figure 3).

Non-compliance

In addition to the complaints, Jack refused to watch the videos; and Frances' disruptive behaviour during the good conversation and turn-taking training, may have indicated a lack of compliance. In so far as the interested/bored and good conversation target behaviours were concerned, this behaviour could also indicate escape and aggression which may have resulted from the unintentional extinction procedure. However, extinction did not occur in the manners and turn-taking tasks because in those tasks social praise was always available to the participants following imitation of the target behaviours. Further, both Frances and Jack experienced this social praise at least once in training but did not continue to emit target behaviours. Given some of the comments made by Frances and Jack during training, a further explanation may be required. That is, it is possible that Frances and Jack refused to comply with the instruction shown in the videos (i.e., take turns, respond appropriately to coughing). This may have obstructed video modelling from being effective in changing their behaviour. M.H. Charlop-Christy (personal communication, 13 August 2007) suggested that knowing what behaviour is required but failing to emit such behaviour indicates non-compliance, rather than the failure of video modelling per se. Charlop-Christy's suggestion seems to be supported by Jack's (response to coughing) and Frances' (turn-taking) ability to describe the videos at the end of training. Therefore, non-compliance seems to have contributed to Jack's and Frances' failure to achieve criterion. This lack of compliance may have been influenced by a lack of reinforcers, or by various dimensions of reinforcers (e.g., immediacy, potency). That is, the reinforcers were somewhat delayed and possibly quite weak.

Reinforcers

Charlop-Christy et al. (2000) established in the baseline phase for the participants in their study, that the contingent delivery of reinforcers (ascertained via

a preference test) did not result in criterion performance. M.H. Charlop-Christy (personal communication, 13 August 2007) suggested that if the delivery of reinforcers is effective in changing behaviour for a particular child then an intervention involving the delivery of reinforcers should be preferred over video modelling. That is, producing videos requires effort and time, compared to an intervention involving the delivery of reinforcers (M.H. Charlop-Christy, personal communication, 13 August 2007). For this reason, M.H. Charlop-Christy suggests that any intervention involving video modelling should include a baseline phase which shows that reinforcers have not been effective in teaching a particular skill. A review of the literature before this intervention was designed, did not reveal that this was standard practice. Accordingly, the use of reinforcers in the baseline phase did not occur for the present study. Furthermore, despite that acquisition of secondary reinforcers may be delayed in children with ASD (Lovaas, 2003), which may make identifying reinforcers challenging it would not, normally, be impossible. So, theoretically reinforcers could be used for most, if not all, interventions. Moreover, a video modelling intervention may be appropriate for children who have a history of refusing to follow direct instructions. More particularly, an instruction embedded in a modelled video is less direct, and possibly more subtle. A child, therefore, may follow it (i.e. comply). This did not occur for Jack or Frances in the current study but it may have some potential benefit for children with ASD.

For Jack, in comparison to the video modelling intervention, the error and correction task (delivery of a tangible reinforcer (50 cents) and immediate advice of the correct answer when he answered incorrectly) was effective in teaching Jack interested and bored cues within a short time. The video modelling intervention may have been too indirect in that the experimenter was unable to answer Jack's questions (i.e., the videos were required to do all the teaching). Further, feedback may not have been sufficiently potent, and/or sufficiently immediate. That is, when feedback was delivered it informed Jack that his response was correct or incorrect but did not inform him of the correct response (i.e., the videos supplied the correct responses). Jack experienced other tasks (e.g., Who wants to be a millionaire, What am I) to increase overall participation in the training tasks however it is possible these other

tasks may have competed for time and attention with the training tasks. Delivery of immediate, preferred, and more potent reinforcers (50 cents) were required to maintain Jack's interest in the interested/bored tasks and were effective in changing Jack's behaviour. So, an intervention involving the delivery of preferred, immediate, and potent reinforcers should have been selected as the intervention of choice as Charlop-Christy suggested. Delano (2007a) recommended that more investigations be conducted comparing video modelling with more traditional approaches to changing behaviour. Until the comparison studies are made, Delano suggested that it was presumptuous to suggest that video modelling was more effective than other treatment models for children with autism. Unfortunately, this review was published after the current study began.

As already mentioned, in the task-type modelling, each participant (Jack, Frances, Brian) emitted some of the target behaviours and therefore experienced the social praise delivered to the video models. However, for Jack and Frances, the social praise delivered may not have been reinforcing (or sufficiently so) as it did not increase production of the target behaviours. As previously discussed, the videos may have been too complex for Brian, so a conclusion as to whether delivery of social praise was sufficient or not would not be appropriate. Social praise was chosen as a consequence in the modelling videos because it was considered more likely to be available in the natural environment and would therefore assist in generalisation and maintenance of the target behaviours once acquired (Stokes & Baer, 1977).

For Jack (manners), if the video model had received 50 cents when the model responded politely to coughing, Jack may have emitted the target behaviour. In other words, the potential social reinforcers (i.e., social praise) signalled by the videos were not sufficiently reinforcing.

In addition, Jack's behaviours of giggling/smiling when people coughed; and lack of eye contact had a long history. Jack's parents noted that many attempts had been made to change these behaviours without success. Therefore, it would appear that changing long history behaviours may require direct interventions and potent reinforcers.

It was intended that the video modelling intervention teach Frances to turn-take to counter her dominant and controlling behaviour. Unfortunately, it appears that Frances' dominant and controlling behaviour contributed to failure in two of the three tasks (i.e., turn-taking, good conversation 1). Frances (during turn-taking) said that the delivery of chocolates would induce her to turn-take. It may be that directing play produced desired (reinforcing) outcomes, and hence the design of any intervention for Frances would need to incorporate the delivery of highly preferred and potent reinforcers to compete with these reinforcing outcomes. Although, Frances' parents reported that Frances did not have any friends and desired friends, lack of friendship may have been a consequence of Frances' dominant and controlling behaviour. That is, the immediate effects of her dominant behaviour (i.e., obtaining a desired outcome) may have outweighed the long term consequence (i.e., loss of friendship). Impulsiveness is defined by Logue (1998) as choosing a less delayed and less valued outcome over a more delayed but more valued outcome. So, Frances may have chosen the less delayed and less valued outcome.

Following the video modelling intervention, the intervention continued for Frances but was modified. Frances was informed that points could be earned for turn-taking. An activity schedule was used and games and tasks were scheduled. Frances was required to earn a minimum of 10 points, at which time the points could be used to purchase an item (e.g., stickers, pen, notebook). The modified intervention proved successful in that Frances asked the author what the author wished to put on the activity schedule in the third session. This behaviour was targeted in the turn-taking task but was not emitted on any occasion. So, compared with the video modelling intervention, token points exchanged for a small item of Frances' choice was effective in changing Frances' behaviour. For Frances (as for Jack), Charlop-Christy's suggestion regarding intervention choice (i.e., delivery of reinforcers if effective over video modelling) appears to be confirmed.

As already mentioned the videos may have been too complex for Brian. Following the completion of the research with Brian, the intervention continued but was modified. Prompting and reinforcement (i.e., praise) procedures were used. Initially, the videos were shown behaviour target by behaviour target with prompting

and Brian was asked to perform each behaviour target as soon as he had viewed the video model perform each behaviour target. Components which proved difficult for Brian were practiced with his therapists on a daily basis. For example, on a different road map (floor type) Brian was asked to discriminate whether cars were coming or not. The video presentations were faded, however the verbal prompts proved difficult to fade, so new modelling videos were made. The model in the new videos demonstrated the task more simply. That is, speech was slower, components were very clear, more question prompts occurred and fewer words occurred. Success to criterion was obtained for both tasks. An additional 20 sessions (over and above the intervention sessions shown in Figure 3) were required to reach criterion in each of the ball retrieval task and the road crossing task. Generalisation across settings and across people (but across only one person for ball retrieval) was achieved to criterion as was maintenance one month later. In a prompting and reinforcement procedure, Steinborn and Knapp (1982) taught a 10 year old autistic girl to cross the road at pedestrian lights using a model of the road and a doll. A high criterion was set for the participant in the Steinborn and Knapp study, however, if criterion was reduced to that for Brian (i.e., all behaviour targets for two consecutive sessions), then Brian, and the participant in the Steinborn and Knapp study achieved criterion in the same time (32 training sessions). The studies were different in that six behaviour targets were divided into two tasks in the current study and in the Steinborn and Knapp study initially a chain of three behaviour targets were taught building up to the six behaviour targets. Despite this, the number of trials to reach criterion were comparable for both participants. However, for the current study it is possible that if the simplified format of the modelling video had been used from the outset, acquisition to criterion may have come in much less time than that required. Furthermore, although, imitation skills were a pre-requisite for entry into the present study, Brian may have benefited from direct training in the imitation of video models. That is, video modelling relies on a child imitating video presented material. Future studies may consider testing a child's ability to imitate a video model as a further entry skill, or build a history of imitation of video models as Nikopoulos and Keenan (2007) did. Alternatively, as Brian received 18 hours of one-on-one teaching in an

early intervention programme which relied on the delivery of reinforcers to effect behaviour change, it is possible that an intervention utilising the delivery of reinforcers as opposed to a video modelling intervention may have resulted in criterion performance more quickly (i.e., based on a history of reinforcement).

In addition, following criterion performance, road crossing was generalised to the actual road as occurred for the Steinborn and Knapp (1982) study. When actual road crossing began, Brian did not discriminate accurately whether actual cars were coming or not, so various videos were made displaying an actual road and showing actual cars coming and no cars coming, and Brian was required to discriminate accurately whether cars were coming or not from the videos. This also occurred for the participant in the Steinborn and Knapp (1982) study. A total of 26 sessions were required before Brian was able to discriminate oncoming traffic with 100% accuracy. Simultaneously, Brian began training to cross the (actual) road safely (with an adult who held his hand) and required 27 sessions to achieve criterion. In the actual road crossing, Brian was required to perform the same steps he had acquired in the road crossing task in toy play. Prompting and praise for correct target behaviours were delivered. In the Steinborn and Knapp study (with criterion equalised as for the current study) only two trials were required for the participant to cross the actual road. Brian was successful in actual road crossing following correct discrimination of oncoming traffic from the videos. Thus, he may have reached criterion more quickly if he had first mastered discrimination of oncoming traffic from the videos.

Accordingly, interventions involving video modelling may not be the most effective intervention for changing behaviour for all children. Delivery of reinforcers (without video modelling) may be sufficient to change behaviour. Additionally, future studies, may consider a further pre-requisite for entry into video modelling studies. More specifically, testing whether participants can imitate a video model, building a history of imitation from video models, and identifying potent reinforcers to be used to achieve behaviour change.

Unlearning

The concept of unlearning was defined by Baldwin (1992) as the need to eliminate old ineffective behaviour in the process of teaching new effective behaviour. In order to do this, a trainee would need to become aware of his/her old ineffective ways of behaving (Baldwin, 1992). It was intended that the wrong-way video achieve this.

Apart from Frances (good conversation 1) and Brian, for the remaining participants who completed training, the videos were generally reasonably effective in that most incorrect baseline or baseline-like responses were eliminated. For four participants, elimination was quicker in the task assigned to the second-ordered condition, regardless of the condition (i.e., wrong/right, right/right). That is, the wrong/right condition was not more effective in eliminating incorrect responses compared with the right/right condition.

As already mentioned, there has been a reluctance to use negative exemplars because of the fear negative exemplars would interfere with skill acquisition, however research (e.g. Baldwin, 1992) has shown that negative exemplars do not interfere with learning to any great degree. However, Baldwin warned that where behaviour reproduction was the goal the use of multiple exemplars and/or positive and negative exemplars may be inappropriate. For Brian, in the ball retrieval task, the wrong-way video exemplar resulted in Brian imitating the model in the wrong-way video. In baseline, Brian had some components of the behaviour shown in the wrong-way video but when the video modelling treatment began his behaviour in treatment sessions became more like the model's behaviour in the wrong-way video, until it was an exact replication of the model's behaviour.

Brian may have imitated the wrong-way video because it built on behaviour partially present in his repertoire and was easier (involved fewer steps) to imitate than the right way video. Accordingly, for Brian the wrong-way video did interfere with learning. The results for Brian in the present study would appear to support Baldwin's suggestion. That is, where reproduction is the goal the use of multiple exemplars and/or positive and negative exemplars may be inappropriate.

For Frances, it is difficult to determine whether she continued with baseline responses which were incorrect (i.e., already in her repertoire) or imitated the model's wrong way responses. From the inception of the video modelling treatment, her responses appeared to become more consistently like those demonstrated in the wrong-way video. However, this suggestion is speculative, because the task was a generalised one, and no response was exactly like that demonstrated in the wrong-way video. That is, the conversations between the participant and the experimenter in training were not exactly the same as the ones shown in the modelling videos. Future studies testing wrong/right exemplars may need to use novel wrong way responses (not the participant's incorrect baseline responses) for the wrong-way video to make any determination as to whether imitation of the wrong-way responses occurred clear.

For Brian and Frances, it seems clear that 'unlearning' did not occur. The wrong way exemplars were not successful in showing the participants that their current behaviour was ineffective. For Brian, the consequence was clearly stated in the modelling video (i.e., "That's the wrong way to cross the road and get the ball"). When Brian crossed the road the wrong way, the experimenter repeated this consequence in the video treatment sessions. However, this consequence repeatedly delivered for eight consecutive sessions did not eliminate the incorrect behaviour of walking the doll across the road. Brian's behaviour changed after the wrong-way video was withdrawn, and the experimenter repeatedly obstructed Brian from walking his doll across the road (by positioning her hand between the doll and the road).

Therefore, for two of the participants in the current study, one participant for whom reproduction of the modelled behaviour was required, and one participant where generalised imitation was required, the wrong-way video did not assist their learning, and in fact may have obstructed it.

Imitation of Non-target Behaviours

As previously stated, the literature attributes success to interventions involving video modelling to its likeness to television and cites reports that children with autism frequently recite and imitate segments from television programmes (e.g., Charlop-Christy et al., 2000; Nally et al., 2005). Frances (turn-taking) and Brian

(road safety), imitated non-target behaviours shown in the videos. Accordingly, when children imitate from television programmes, they choose what to imitate. This appears to be the case for both Frances and Brian, and their choices did not involve the behaviours targeted for imitation.

Future studies may wish to consider that when relying on the likeness of video modelling to television, expected results may not be attained, and furthermore, it may render any video modelling intervention rather vague and unreliable. A functional analysis assessing the antecedents, the behaviour targeted by a child, and available reinforcers, shown both in the television programme and in the imitated setting, may guide creation of effective videos. Alternatively, direct interventions with reinforcement may be more effective in changing behaviour.

Participant Characteristics

Both culture and ethnicity were not predictive of any of the findings. Additionally, multiple diagnoses (Zac, Frances, Matthew) were not predictive of any findings.

Furthermore, classroom placement (i.e., whether placed in a regular classroom or a special classroom) was not predictive of any findings.

Combination of Antecedent and Consequent Strategies to Guide Multi-component Package Designs

As previously mentioned the use of a multi-component package does not necessarily guarantee intervention success. In a review of the research for generalisation and maintenance of social skills with pre-school children, Chandler, Lubeck, and Fowler (1992) found that studies that were able to produce generalisation used a combination of antecedent and consequential strategies (e.g., prompting and reinforcement) whereas studies that achieved no success used a combination of antecedent strategies (e.g., modelling and rehearsal). The authors suggested that a combination of antecedent and consequential strategies may be more successful in controlling behaviour because both antecedents and consequences (i.e.,

both ends of the three term contingency (antecedent, behaviour, consequence)) are used. Although Chandler et al. advanced this argument with regard to generalisation it may also be possible to apply it to skill acquisition. So, any strategy for skill acquisition that uses antecedents only is likely to be weaker than one that employs both antecedents and consequences.

As previously mentioned the reviewers (e.g., Ayres & Langone, 2005) questioned whether video modelling could be successful in its own right and the findings from this study suggest that the delivery of reinforcement was necessary to achieve gains (see also Alcantara, 1994; Apple et al., 2005; Sansosti & Powell-Smith, 2008). Thus, an intervention using video modelling alone may produce inferior results compared with an intervention that uses both video modelling and positive reinforcement. Future studies may wish to consider this point in the design of effective multi-component packages.

Parent Satisfaction

Generally, all parents rated the intervention for their children positively. Two parents (for Paul and Frances) rated the intervention positively but in the moderate range more often than the other parents.

Frances' parents commented that if they could have reinforced the target behaviours at home better results may have been obtained. Frances' parents also commented that if Frances had known that the intervention may result in her making friends, she may have been more motivated to learn. The turn-taking video introduction made explicit that "when friends share, they will probably want to play again," yet this did not change Frances' behaviour in the turn-taking task. It is possible, however, that Frances did not consider the experimenter a potential friend. Frances' parents' suggestions may well have resulted in greater success, however are incompatible with research. More particularly, if Frances' parents had reinforced the target behaviours at home, the current study would have been less controlled and any effects could not have been attributed solely to the independent variable (i.e., video modelling). However, with the benefit of hindsight an additional narration could have been added to the video introduction to make the teaching goal clear to the participant

(e.g., “the models in the video will show you how to play with friends, so that your friends will want to play with you,” “the models in the video will show you the difference between a good and bad conversation so you can learn to have good conversations with your friends”) (see Shipley-Benamou et al., 2002). It is also possible that if Frances had chosen the learning goal, the intervention may have resulted in more success for Frances. An additional review of the literature with the ASD population as it pertained to children determining goals for learning, did not yield any studies. However, for Jack, after the intervention was completed, the author and Jack’s mother asked him what he wanted to learn. That is, he could choose a skill and the author would make the video, and further he could assist in creation of the video if he wished. Jack declined the offer.

Paul’s parents may have scored the intervention in the moderate range because the behaviour targeted was not important to them. The target behaviours were different from the behaviours initially targeted by Paul’s parents because high levels of correct responding occurred in the pre-intervention test. Hence a change of target behaviour was required, and because of time constraints, it occurred without consultation with Paul’s parents. Paul could perform the behaviours targeted by his parents, but obviously did not perform them in their presence. Thus, although an evaluation by Paul’s parents in the moderate range was very acceptable, they may have viewed the intervention more positively if more consultation had occurred.

Overall, the intervention was viewed positively by parents and participants (via reports to parents). Video modelling was considered by parents a very acceptable procedure. Although criterion was not reached for all tasks for all children, parents nevertheless reported that the participants made positive gains and furthermore they viewed those gains positively. Accordingly, from the parents point of view, the intervention was a successful one.

Future Directions

In order to determine whether wrong/right or right/right video exemplars are superior in acquisition and generalisation of a skill, this study would need to be replicated with appropriate changes to eliminate confounds.

Future studies should consider careful selection of participants. Firstly, in addition to testing imitation skills, a further pre-requisite may be needed. That is, testing whether participants can imitate a video model, or alternatively a history in imitating video models could be built.

Secondly, ensuring that reinforcers have not been effective for skill acquisition in the past so that participants are not selected for a video modelling intervention where another intervention (e.g., delivery of reinforcers) would be equally effective or more effective in changing behaviour.

Thirdly, for children who consistently receive reinforcers for work completed (and thus secondary reinforcers may be well-conditioned), multi-component designs (video modelling with delivery of reinforcers) may be needed to avoid the potential negative effects of vicarious reinforcement.

Fourthly, where multi-component designs are selected, conducting preference assessments may ensure that potent reinforcers are selected to compete with long history behaviours and/or impulsiveness.

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Appendix A

Copy of advertisement seeking participants placed in local Autism NZ Newsletter.

Help Required

My name is Anna Dekker and I am currently completing a Master of Applied Psychology at the University of Waikato.

The area of my project is video modeling to teach social skills to children on the Autistic Spectrum. Previous reports have shown that children with autism can acquire social skills modelled via the medium of video.

Currently videos are available which teach social skills via a demonstration of the right way and the wrong way to perform the skill. Some videos show the right way only. However there are no reports evaluating whether including both the right way *and* wrong way is an effective teaching strategy. I will be assessing which strategy (right way only versus right way/wrong way) produces faster learning and which strategy produces more generalization (i.e., the skill is seen in settings different from the setting the skill was trained in, with other people and at other times). The literature suggests that demonstrating the social skill both the right way and the wrong way will produce better generalization.

I am looking for children to help with this project. Because the question is not 'if video modelling works' but which method works best, children need to have the skills shown to be needed for success. They need to:

- fit the diagnostic criteria for autistic spectrum disorder;
- be between the ages of 5 and 14;
- be verbal (i.e., can produce sentences);
- be able to imitate simple actions (an assessment of imitation will be conducted); and
- be reported to be able to watch television continuously for a minimum time of 10 minutes

The specific social skill(s) selected for teaching will be chosen in consultation with the parents and will be skills that the children have not been known to demonstrate successfully.

Previous research suggests that children who participate will acquire the social skill being taught.

Further details of the study can be made available on request. The study will be supervised by the Psychology Department at the University of Waikato. Contact details are as follows:

Anna Dekker
Telephone: 07 849 XXXX
Mobile: 021 212 XXXX
Email: adekker@XXXXXXX.co.nz

Appendix B

Copy of letter sent to parents setting out the process regarding participation.

Anna Dekker
Masters Student
Psychology Department
University of Waikato
Private Bag 3105
Hamilton

Telephone: 84X XXXX
Mobile: 021 21X XXXX

Email: adekker@xxxxxx.co.nz

Supervisor: Jo Thakker
Telephone: 856 2889 ext 6809
Mobile: 027 XXX XXXX
Email: jthakker@waikato.ac.nz

(date 2007)

(address)

Dear

My name is Anna Dekker and I am researching video modelling to teach social skills to children with Autistic Spectrum Disorder. Previous reports have shown that children with autism can acquire social skills modelled via the medium of video. I will be comparing two different ways (positive and negative examples versus positive example only) of teaching a social skill. As there are currently videos on the market that have not been evaluated but teach social skills using positive and negative examples, I hope that the results of this study will make it clear which way works best. This information can then be used to guide parents, teachers and other professionals in selecting videos that are likely to produce the most success in teaching social skills to children with autistic spectrum disorder.

Please find attached an Information Sheet which sets out brief details regarding the Research Project. If you would like to discuss the research project more fully and/or ask questions please do not hesitate to contact me. If you would prefer, a meeting can be arranged.

If you would like your child to help in this project a Consent Form is attached for signature and can be returned in the enclosed stamped addressed envelope.

Below is an outline of what will occur should your child participate in the research.

1. A meeting (not longer than one hour in length) will be arranged with you at a time when your child can be available to:

   (a) confirm that your child fits the diagnostic criteria for Autistic Spectrum Disorder
   (b) confirm that your child is verbal and can produce sentences
   (c) confirm that your child can imitate seven different two-step actions to 80% accuracy
   (d) request your confirmation that your child can watch television continuously for a minimum time of 10 minutes

   The above criteria for selection of participants will increase the probability that the method of teaching will not result in failure for your child.

   (e) discuss the social skills you would like your child to learn
   (f) discuss the most practicable setting (i.e., home or school or other) where teaching can occur
   (g) arrange another meeting at a convenient time for no more than 20 minutes where I can assess whether the social skills selected for teaching are unknown to your child.

2. I will need to make the appropriate videos.

3. I will contact you to discuss when teaching can begin.

4. The social skills will be taught via video modelling.

5. When the social skills have been taught they will be tested in another setting with another person (i.e., generalises) and at two weekly intervals (i.e., is maintained).

6. I will report the results to you.

I will keep you informed of stages and upcoming stages and also inform you of progress at every stage. It is hoped that the research will take between four and six months.

If you have any queries please do not hesitate to telephone either myself or my supervisor.

I thank you for your interest.

Yours faithfully,

Anna Dekker
Masters Student

Appendix C

Copy Information Sheet sent to parents setting out details of the study and rights of the parents/participants.

THE UNIVERSITY OF WAIKATO

HUMAN RESEARCH ETHICS COMMITTEE

Information Sheet

Who are the researchers? Anna Dekker
Supervisor: Jo Thakker

Where can they be contacted? Anna Dekker: Phone: 84X XXXX;
Mobile: 021 21X XXXX
email:adekker@xxxxxxx.co.nz

Jo Thakker Phone: 856 2889 ext 6809
Mobile: 027 XXX XXXX
email: jthakker@waikato.ac.nz

What is the study about?

To test if social skills taught via the medium of video modelling will be more accurate, faster and more durable (i.e., the skill taught is seen in another setting, with another person and at different times) under a condition where a positive example only is shown to the participant or where a positive and negative example are shown to the participant in training.

What will the participant/s have to do and how long will it take?

In initial meetings the participant will be asked to imitate simple actions and will be asked open questions to determine whether he/she can produce sentences.

Social skills to be taught will be chosen in conjunction with the parents/caregivers and the participant will be assessed to check that the social skills are unknown.

In a baseline/initial condition the participant will be asked/given opportunities to perform the social skill to be taught (i.e., target skill). Data will be taken.

In a training condition, the participant will be asked to view a short (1-5 minutes long) video vignette of the target skill twice. Then the participant will be asked to perform the target skill. Data will be taken.

If the target skill is not acquired over two test sessions, in the next training session, the video vignette will be viewed again by the participant and re-testing will occur.

Once acquisition has been achieved (at least 80% accuracy on two separate occasions) then the skill will be tested in another room with another person and at another time.

Maintenance will be tested on a fortnightly basis for a maximum period of six weeks. It is proposed that the research will take between four and six months.

What does the researcher expect the major outcomes from the research will be (e.g. publications/dissemination)?

The major outcomes from the research will be dissemination via Autism N.Z. and all going well publication which is intended.

What will happen to the information collected?

The information collected will be used to complete a Thesis (Master of Applied Psychology). A written report in non-technical language outlining the information collected and findings will be sent to the parents of the participants. The information will be archived at the University of Waikato only. All names of the participants will be protected, e.g., anonymity will be maintained.

What degrees and kinds of confidentiality and anonymity will be required for this research?

Confidentiality and anonymity will be achieved by changing the names of the participants to fictional names for the purposes of the written thesis and published article and in any discussions with any researchers who are not immediate supervisors. Research assistants will be required to sign a Confidentiality Form to maintain participant (and their families/caregivers) confidentiality.

Declaration to participants:

If you take part in the study, you have the right to:

Refuse to answer any particular question, and to withdraw from the study at any time.
Ask any further questions about the study that occur to you during your participation.
Be given access to a summary of the findings from the study when it is concluded.

You have the right of access to any data that has been collected from/about you. If you feel your trust has been abused, complaints in this regard, or in any other regard, can be made to:

Dr Robert Isler
Phone 07 838 4466 ext. 8401
Email: r.isler@waikato.ac.nz

Appendix D

Consent form forwarded to parents of prospective participants. This form was required to be signed by the parents prior to their child participating in the study.

University of Waikato
Psychology Department

CONSENT FORM

PARTICIPANT'S COPY

Research Project: Video modelling to teach social skills to children with autism

Name of Researcher: Anna Margaretha Dekker

Name of Supervisor (if applicable): Dr Jo Thakker, University of Waikato

I have received an information sheet about this research project or the researcher has explained the study 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 participate in this research project and I understand that I may withdraw at any time. If I have any concerns about this project, I may contact the convenor of the Research and Ethics Committee (Dr Robert Isler, phone: 838 4466 ext. 8401, e-mail r.isler@waikato.ac.nz)

Participant's Name:_____Signature:_____Date:_____

==========

University of Waikato
Psychology Department

CONSENT FORM

RESEARCHER'S COPY

Research Project: Video modelling to teach social skills to children with autism

Name of Researcher: Anna Margaretha Dekker

Name of Supervisor (if applicable): Dr Jo Thakker, University of Waikato

I have received an information sheet about this research project or the researcher has explained the study 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 participate in this research project and I understand that I may withdraw at any time. If I have any concerns about this project, I may contact the convenor of the Research and Ethics Committee.

Participant's Name: _____Signature:_____ Date:_____

Appendix E

Copy of Social Skills List used as a guide to assess participant competencies and to aid in selection of target behaviours.

Social Skills List

No.	Skill	Condition 1	Condition 2
1.	Greetings	Hello, how are you	Goodbye, see you later
2.	Expressive labelling of emotions	Happy versus Sad	Tired versus Afraid
3.	Independent play	Join the dots or similar	Colouring
4.	Oral comprehension	When/Why Questions	What/Where questions
5.	Social Play (possessiveness)	Blocks	Vehicles or animals
6.	Co-operative play	Card game “War”	Card game “10”
7.	Conversational speech 1	Scripted conversation 1 (past)	Scripted conversation 2 (present)
8.	Turn-taking play	Connect 4	Pile up tower
9.	Empathy	Response to someone tripping	Response to sad story
10.	Conversation discrimination	Question vs comment	Request vs Order
11.	Initiating conversation (Social Skills Games)	You want to tell …..What do you say	You want to ask ….. What do you say
12.	Initiating conversation (Social Skills Games)	Question	Comment
13.	Politeness (Social Skills Games)	Please; excuse me; can I help	Thank you; congratulations: Sorry
14.	Conversation topics	Staying on topic	Changing the topic/turn-taking
15.	Body language	Interested vs bored	Polite vs rude
16.	Solving Problems (Social Skills Games)	Sentence completion	If/then
17.	How to play with specific toys		
18.	Question answering (for example)	What are your favourite games Who do you sit next to in class What do you like to do in play time What do you like to eat for breakfast	What is your favourite TV show What do you like to do at weekends What sports do you like to play What do you do when you are happy
19.	Telephone	Leaving a message	Taking a message
20.	Questions/comments	Personal versus non-personal	Compliment versus comment
21.	Conversation	Starting a conversation	Ending a conversation
22.	Personal space		

References

Social skill number

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19 Schroeder, A. (1996). *Socially speaking.* Cambridge: LDA.

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21-22 Baker, J. (2001). *The social skills picture book.* Arlington, TX: Future Horizons, Inc.

Appendix F

Copy of list of two-step actions used to test pre-requisite entry skills with prospective participants.

Pre-requisite Skills

Data form

Imitation skills

SD: "Do this"
Action modelled: Jump, clap hands Correct/Incorrect

SD: "Do this"
Action modelled: Both arms in air, hands on hips Correct/Incorrect

SD: "Do this"
Action modelled: Sit down, stomp feet Correct/Incorrect

SD: "Do this"
Action modelled: Pretend to eat with cup, roll car Correct/Incorrect

SD: "Do this"
Action modelled: Touch nose, touch feet Correct/Incorrect

SD: "Do this"
Action modelled: Poke out tongue, move head from side to side Correct/Incorrect

SD: "Do this"
Action modelled: Hands on head, hands on hip Correct/Incorrect

(Need: chair, car, cup)

Reference

Partington, J.W., & Sundberg, M.L. (1998). *The assessment of basic language and learning skills.* CA: Behaviour Analysts, Inc.

Appendix G

Modelling script for the ball retrieval task in the road safety target behaviour for Brian. This task was assigned to the wrong/right video modelling treatment condition. A play mat of a road with two park-like areas was used with props to make a school in an area which also served as the school playground. The model manipulated a boy doll; the author manipulated a girl doll; and the author also manipulated an adult female doll who represented the teacher. The wrong way exemplar was derived from an instructional road safety DVD (Environment Waikato Regional Council, n.d.).

Right way exemplar (Video exemplar is 30 sec long)

Author as model's play partner: "Let's play ball."
Model: "Okay."
(*Author and model use dolls to kick ball backwards and forwards to each other*)
Author as model's play partner: "Good kicking."
(*Author as model's play partner kicks ball across the road*)
Author as model's play partner: "Oh no, what happened?"
Model: "The ball went across the road. I have to go get the teacher to help me cross the road to get the ball."
(*Model walks his doll to teacher doll. The teacher doll is standing in the playground*)
Model: "Can you help me get the ball? It's gone across the road."
Author as teacher: "It's really good that you came and asked me for help. Roads are dangerous and you do need help to cross the road. When we get to the road we need to stop."
(*Author and model move dolls towards road. Author's doll is walking slightly behind model's doll so that model initiates and clearly stops the boy doll on the footpath in front of the road*)
Author as teacher: "That's good stopping. Well done."

Wrong way exemplar (Video exemplar is 15 sec long)

Author as model's play partner: "Let's play ball."
Model: "Okay."
(*Author and model use dolls to kick ball backwards and forwards to each other*)
Author as model's play partner: "Good kicking."
(*Author as model's play partner kicks ball across the road*)
Author as model's play partner: "Oh no, what happened?"
Model: "The ball went across the road. I'll go get it."
(*Model moves doll to walk across the road*)
(*Author moves van along road and swerves to miss the model's doll*)
Author: (*in voice with flat affect*) "Phew that was close, that's the wrong way to cross the road and get the ball."

Appendix H

Modelling script for the road crossing task in the road safety target behaviour for Brian. This task was assigned to the right/right video modelling treatment condition. A play mat of a road with two park-like areas was used together with props to make a school in an area which also served as the school playground. The model manipulated a boy doll; and the author manipulated an adult female doll who represented the teacher. The content for the exemplars was derived from an instructional road safety DVD (Environment Waikato Regional Council, n.d.).

Right way exemplar 1 (Video exemplar is 30 sec long)

(*Teacher doll and boy doll both standing on footpath in front of road*)

Author as teacher: "What do we need to do to cross the road safely?"

Model: "Look both ways and check for cars."

(*Model initiates by turning boy doll both ways to look for cars, as does author as teacher, but after model has initiated*)

Author as teacher: "Any cars coming?"

Model: "Just the white one. We need to wait."

Author as teacher: "Good."

Model: "It's gone now. We have to check for more cars though."

Author as teacher: "Good."

Model: "Look both ways."

(*Model initiates by turning boy doll both ways to look for cars first, as does author as teacher, but after model has initiated*)

Model: "No cars coming. Lets link hands and cross quickly."

(*Model and author as teacher walk dolls across road*)

Author as teacher: "Excellent. That's the safe right way of crossing the road."

Right way exemplar 2 (Video exemplar is 17 sec long)

(*Author as teacher and model dolls are on other side of the road on the footpath facing the road. Boy doll is holding ball*)

Model: "I've got the ball. Lets go back across the road."

Author as teacher: "What do we need to do?"

Model : "Look both ways."

(*Model initiates by turning boy doll both ways to look for cars, as does author as teacher, but after model has initiated*)

Model: "No cars coming. Let's link hands and cross quickly."

(*Both model and author as teacher walk dolls across road*)

Author: "Well done. That's the right way to cross the road safely. Good."

Appendix I

Training stories for the WHEN and WHY task in the oral comprehension target behaviour for Jacob. The stories were read in random order. In the video modelling treatment, the questions were asked in the same order as shown below, but were mixed in the first three maintenance probes.

Story 1
At breakfast Janet accidentally broke the milk jug.
Janet was afraid she would get into trouble so she hid the broken pieces.
Janet hid the broken pieces behind the garage.

Questions
When did Janet break the milk jug?
Why did Janet hide the broken pieces?

Story 2
John liked to read books about Thomas the Tank Engine.
John read every day in his bedroom.
John liked Thomas the Tank Engine because John loved trains.

Questions
When did John read books about Thomas the Tank Engine?
Why did John read books about Thomas the Tank Engine?

Story 3
In the school holidays Amy went to the circus.
Amy loved to see the clowns at the circus.
The clowns always did silly things to make everyone laugh.

Questions
When did Amy go to the circus?
Why did Amy like to go to the circus?

Story 4
Grace went swimming every Tuesday after school.
Grace swam at the school pool.
Grace swam every week so she could be the fastest swimmer.

Questions
When did Grace go swimming?
Why did Grace swim every week?

Appendix J

Training stories for WHAT and WHERE task in the oral comprehension target behaviour for Jacob. The stories were read in random order. In the video modelling treatment, the questions were asked in the same order as shown below, but were mixed in the first three maintenance probes.

Story 1
Every weekend Greg liked to help his Mum bake cakes.
The cakes went to the cake shop.
Greg liked to help so he could earn pocket money.

Questions
What did Greg like to do?
Where did the cakes go?

Story 2
Kate liked to play schools on Saturdays.
Kate played schools in the sunroom.
Kate liked to play schools because when she grew up she wanted to be a teacher.

Questions
What did Kate do on Saturdays?
Where did Kate play?

Story 3
Jerry and Bill played soccer after school.
They played on the soccer field.
Jerry and Bill practiced hard because they wanted to be chosen for the school team.

Questions
What did Jerry and Bill do?
Where did they play?

Story 4
Allan and his Dad went fishing at the lake.
Allan liked to fish with his Dad because they always had fun together.
Allan and his Dad fished once a month.

Questions
What did Allan and his Dad do?
Where did Allan and his Dad go?

Appendix K

Statements used in video modelling treatment for the reciprocal statements task in the conversational reciprocity target behaviour for Jacob. The statements were read in random order. Jacob was given 5 sec to respond. A reciprocal statement was required to be made by Jacob in order to be scored correct. The content for the statements was derived from the Autism Partnership Curriculum for Discrete Trial Teaching with Autistic Children (Leaf & McEachin, 1999).

I'm wearing _____ pants.

I like to drink lemonade.

I have blond hair.

My favourite animal is a giraffe.

I have green eyes.

I like to eat chocolate.

I like to play monopoly.

My favourite colour is yellow.

My Dad's name is John.

My favourite TV programme is 60 Minutes.

Appendix L

Questions used in video modelling treatment for the reciprocal questions task in the conversational reciprocity target behaviour for Jacob. The questions were read in random order. Jacob was given 5 sec to respond. A reciprocal question was required to be asked by Jacob in order to be scored correct. The content for the questions was derived from the Autism Partnership Curriculum for Discrete Trial Teaching with Autistic Children (Leaf & McEachin, 1999) and material provided in Goals to Grow, the ABA Way (Johnston, Napiorski, & Yanazzo, 2006).

How are you?

What's your name?

Do you have any sisters?

How old are you?

What do you like to play with?

What's your mother's name?

Does your mother work?

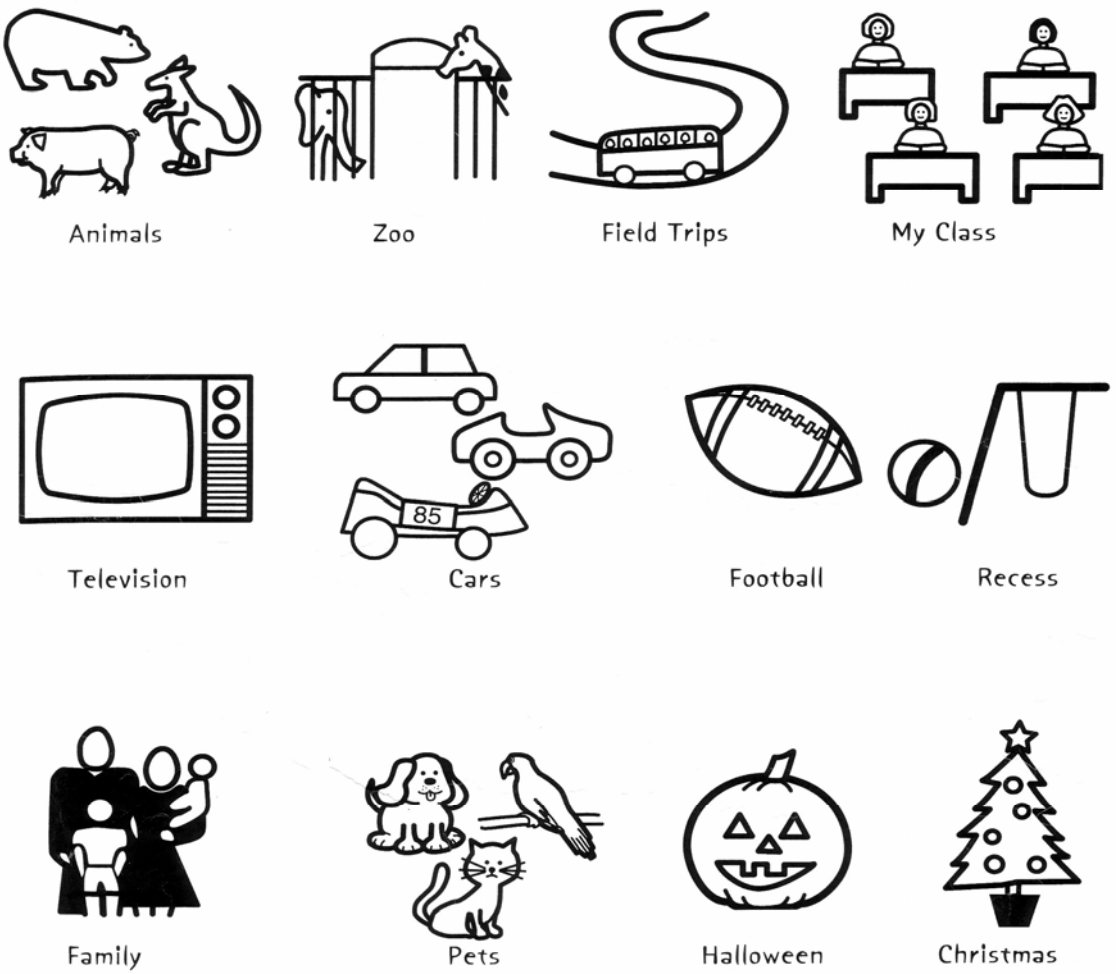
How many people live at your house?

Do you have any pets?

What time do you go to bed?

Appendix M1

Copy of list of topics depicted visually as a prompt for participants to choose a conversation topic for interested/bored and good conversation target behaviours/tasks.



Picture symbols made with the Boardmaker ™ and the Picture Communication Symbols. The Picture Communication Symbols © 1981-2003 used with permission from Mayer-Johnson Inc., P. O. Box 1579, Solana Beach, CA 92075. 800/588-4548 (phone), 858/550-0449 (fax) and www.mayer-johnson.com.

Reference
Murdock, L., & Khalsa, G.S. (2003). Joining in: A program for teaching social skills. Kansas: AAPC.

Appendix M2

Additional list of topics used as a prompt for participants to choose a conversation topic in interested/bored and good conversation target behaviours/tasks. Some topics were repeated from the visual list in Appendix M1 but represented without pictures (i.e., TV, Family, Pets Zoo, Christmas, Cars).

List of Topics we can talk about

TV

FAMILY

PETS

CATS

DOGS

SCHOOL

CHRISTMAS

BIRTHDAY

FRIENDS

WEEKENDS

FISHING

BEACH

SWIMMING

PLAY STATION GAMES

MOVIES

SHOPPING

GOING TO THE PARK

SKATEBOARDS

BIKES

CARS

EXERCISE

COOKING

TAKEAWAYS

SPORT

COMPUTERS

ZOO

Appendix M3

Additional list of topics used as a prompt for participants to choose a conversation topic in interested/bored and good conversation tasks/target behaviours.

More Topics we can talk about

TAG	DRAWING
BOOKS	GRANDPARENTS
SCOOTERS	ART
TOYS	10 PIN BOWLING
BOARD GAMES	HARRY POTTER
BREAKFAST	HORSES
BEING SICK	HOLIDAYS
COMICS	SUPER HEROS
CARTOONS	ODD JOBS
HOMEWORK	POCKET MONEY

Appendix M4

Additional list of topics used as a prompt for participants to choose a conversation topic in interested/bored and good conversation target behaviours/tasks. One of the participants, Zac, contributed to this list.

More topics we can talk about

DVDs	Recent movies
Lego	Action figures
Transformers	Kiwiana
Exscite – Museum	School bags
Earthquakes	Animals
Insects	Army
Police	Native birds
Caves	Wetas
Kauri trees/Museum	Forests
BMX bikes	Luge

Appendix M5

Additional list of topics used as a prompt for participants to choose a conversation topic in interested/bored and good conversation target behaviours/tasks.

More topics we can talk about

Swimming	Holidays
Favourite book	The park
What makes you happy	Birthdays
A computer game	What makes you sad
A special place you went to	Pizza
What makes you scared	What makes you mad
Your house	Your dad’s job

Your mum’s job	Favourite food
Best friend	Roller skating
A problem	Favourite game
The beach	Your Grandma
School	Last night
Yesterday	Favourite pet
Shopping	Something dangerous
The mall	Disneyland
Your room	Favourite TV show

Favourite	Easter
Softball	Rugby
Animal	Cartoon character
Something fun	Barbie dolls
Being proud	Trains
Favourite place to go	Bugs
Riding bikes	Coins

Reference

Freeman, S., & Dake, L. (1996). *Teach me language*. Langley, B.C, Canada.: SKF Books

Appendix M6

Additional list of topics used as a prompt for participants to choose a conversation topic in interested/bored and good conversation target behaviours/tasks.

More topics we can talk about

Dancing	Clothes
Shopping	Collecting things
Glitter	Acting
Tidying up	Bicycles
Roller skates	Growing up
Nail polish	Feelings
Manners	Communication
Being a New Zealander	Something new

Appendix N

Scripts of narration in the form of video introductions for the manners target behaviour (i.e., correct response to coughing, eye-contact) for Jack. The video introductions explained what the video exemplars in the video modelling treatment were intended to show. Some of the content for the eye-contact video introduction was derived from an instructional DVD (Model Me Kids™, 2005). In both video introductions the author's upper half of her body is seen standing in her living room talking facing the camera. The video introduction was played immediately prior to the relative modelling exemplars following four video presentations.

Right/Right Condition

Correct response to coughing (Video introduction is 15 sec long)

"Sometimes people cough.

When they cough it's polite to say are you alright and can I get you anything.

People will almost always thank you for saying that, its good manners."

Wrong/Right Condition

Eye-contact (Video introduction is 25 sec long)

"When you talk to someone or someone talks to you it's good to turn your body to face that person and to look at their eyes.

If you don't do these two things, the person may think that you are not interested in talking to them and they may not carry on the conversation, or walk away."

Appendix O

Scripts of narration in the form of a video introduction for the turn-taking target behaviour for Frances. The video introduction explained what the video exemplars in the video modelling treatment were intended to show. In the video introduction the author's upper half of her body is seen standing in her living room talking facing the camera. The author is talking in a friendly manner. The video introduction was played immediately prior to the modelling exemplars following six video presentations for Frances. Some of the content for the video introduction was derived from an instructional DVD (Model Me Kids™, 2005). This video introduction is detailed and explained explicitly to ensure lack of imitation of the video exemplars was not caused by any lack of knowledge on Frances' part.

Right/Right Condition

Turn-taking (Video introduction is 1 min long)

"It's fun to play schools with a friend.
Taking turns is the fair way to play.
It means both friends get a chance to play and have fun.
It's good to take turns with your friend deciding what goes on the timetable.
First, you choose something, then your friend chooses something, then you choose something again.
It's good to talk to your friend and decide who will be teacher first.
For instance, you can say, "Let's take turns at being the teacher. Would you like to go first or shall I."
It's good to make sure your friend actually gets a turn at being teacher.
Once your friend has had a turn, you can swap over and be the teacher again.
When friends get a turn they will most likely want to play again."

Appendix P

Scripts of narration in the form of video introductions for the road safety target behaviour (i.e., ball retrieval and crossing road tasks) for Brian. The video introductions explained what the video exemplars in the video modelling treatment were intended to show. In both videos the author's upper half of her body is seen standing in her living room talking facing the camera. The author's tone in the videos is serious. The video introduction was played immediately prior to the relative modelling exemplars following four video presentations.

Right/Right Condition

Ball retreival (Video introduction is 30 sec long)

"To cross the road safely we need to look both ways to see if cars are coming.
If a car is coming wait until it goes past.
Then check again for cars.
If no more cars are coming then link hands and cross quickly."

Wrong/Right Condition

Crossing road (Video introduction is 30 sec long)

"At school if you are playing with a ball and it goes across the road you must NEVER (*emphasis added)* chase the ball across the road.
There could be cars coming and you could get hurt (*author frowns*).
You need to go to the teacher and say "Can you help me get the ball."
The teacher will go with you and remind you to STOP (*emphasis added*) when you get to the road."

Appendix Q

Stories used in the generalisation probes for the WHEN and WHY questions task in the oral comprehension target behaviour for Jacob. The stories were read in random order. The questions were asked in the same order as shown below.

Story 1
After school a photographer took a photo of Gail.
Gail's photo was taken in front of the school hall.
Gail had her photo taken because she won the table tennis competition

Questions
When did Gail have her photograph taken?
Why did Gail have her photograph taken?

Story 2
At lunchtime Zac painted a picture of a monster.
He painted the picture at the art station.
He painted the picture of the monster so he could scare all the children.

Questions
When did Zac paint the picture?
Why did Zac paint the picture?

Story 3
Beth filled up the watering can at the outside tap.
At 6 O'clock Beth watered the seedlings she had planted.
She watered the seedlings so they would grow into flowers.

Questions.
When did Beth water the seedlings?
Why did Beth water the seedlings?

Story 4
At 3 O'clock Jason and Amy ran home as fast as they could.
Jason and Amy lived in Jasmine Street.
They ran home so they would not miss their Grandmother who was visiting.

Questions.
When did Jason and Amy run home?
Why did Jason and Amy run home?

Appendix R

Stories used in the generalisation probes for the WHAT and WHERE questions task in the oral comprehension target behaviour for Jacob. The stories were read in random order. The questions were asked in the same order as shown.

Story 1
On Sunday Bill went to the park.
It was a windy day and Bill flew his kite.
Bill loved to see the wind make his kite fly high into the air.

Questions.
What did Bill do?
Where did Bill go?

Story 2
On Saturday Bess went to town with her mother.
They bought new shoes.
Bess was going to wear her new shoes the minute she got home.

Questions.
What did Bess and her mother buy?
Where did Bess and her mother go?

Story 3
Michael and Dan played card games all afternoon.
They played at Dan's house.
Michael liked to play with Dan because Dan was his friend.

Questions.
What did Michael and Dan play?
Where did Michael and Dan play?

Story 4
On Saturday afternoon, Jamie went to a birthday party.
Jamie ate too many lollies.
Jamie felt sick and couldn't play any of the party games.

Questions.
What did Jamie eat?
Where did Jamie go?

Appendix S

Statements used in the generalisation probes for the reciprocal statements task in the conversational reciprocity target behaviour for Jacob. The statements were read in random order. Both the author and Jacob's father served as the experimenters for the generalisation probes and hence the underscores represent the individual preferences of the experimenters.

My favourite Thomas train is _____.

I'm wearing a _____ (colour) sweater/top.

I love _____ (food).

My friend's name is _____.

My favourite subject at school was _____.

I have a pet _____ named _____.

I like _____at the beach.

_____makes me happy.

_____scare me.

My favourite song is _____.

Appendix T

Questions used in the generalisation probes for the reciprocal questions task in the conversational reciprocity target behaviour for Jacob. Questions were asked in random order. Both the author and the Jacob's father served as experimenters for the generalisation probes.

What did you do today?

What present would you like to get next birthday?

What sport do you like to play?

What did you eat for lunch?

Who did you talk to today?

What are you going to do this afternoon?

What is your favourite thing to do?

Do you like to watch TV?

How many pets do you have?

What is your favourite story book?

Appendix U

Copy Parent Consumer Satisfaction Questionnaire sent to the parents of each participant to assess satisfaction with behavioural goals, the procedure, and treatment outcomes.

Parent Consumer Satisfaction Questionnaire

Parents Name: _____ Date: _____

The following questionnaire is part of an evaluation of the video modelling treatment that your child received. Your point of view is valuable. It is important that you answer as honestly as possible. This evaluation will enable us to evaluate and improve the services offered. There are no right or wrong answers.

Your child was taught: *(target behaviour)*

Please circle the response that best expresses how you honestly feel and is your first reaction.

A. SOCIAL SIGNIFICANCE OF THE BEHAVIOURAL GOAL (i.e., skill taught)

1. The social skill taught was

very unimportant	moderately unimportant	somewhat unimportant	neutral	somewhat important	moderately important	very important

2. The social skill taught was a skill I/we wanted my/our child to learn.

very undesirable	moderately undesirable	slightly undesirable	neutral	slightly desirable	moderately desirable	very desirable

B. SOCIAL APPROPRIATENESS OF THE PROCEDURE

1. Video modelling as a treatment procedure was

very unacceptable	moderately unacceptable	slightly unacceptable	neutral	slightly acceptable	moderately acceptable	very acceptable

2. The length of treatment was

too long	moderately long	somewhat long	neither long nor short	somewhat short	moderately short	too short

3. Did your child express dissatisfaction with/complain about the procedure?

always	very frequently	moderately frequently	neutral	moderately infrequently	very infrequently	never

4. My child expressed feelings about the procedure that were

very negative	moderately negative	slightly negative	neutral	slightly positive	moderately positive	very positive

5. Did you feel you were informed throughout the procedure?

very uninformed	moderately uninformed	slightly uninformed	neutral	slightly informed	moderately informed	very informed

C. SOCIAL IMPORTANCE OF THE TREATMENT OUTCOMES

1. Were you satisfied with the results (i.e., graphically depicted), as reported to you?

very dissatisfied	moderately dissatisfied	slightly dissatisfied	neutral	slightly satisfied	moderately satisfied	very satisfied

2. Did you observe any behaviour change(s)? Yes/No

Please briefly describe/list what behaviour change(s) you observed.

3. Did others (e.g., teachers) report any behaviour change(s)? Yes/No
(If you answered "No" to 2 & 3, please go to No. 6)

Please briefly describe what behaviour change(s) were reported.

4. Were the behaviour change(s) satisfactory (positive)?

very dissatisfactory	moderately dissatisfactory	slightly dissatisfactory	neutral	slightly satisfactory	moderately satisfactory	very satisfactory

5. Did you consider behaviour change(s) to be

very unimportant	moderately unimportant	slightly unimportant	neutral	slightly important	moderately important	very important

6. Did any unpredicted behaviour change(s) occur? Yes/No
   (If you answered "No" above, please go to No. 9)

Please briefly describe/list what unpredicted behaviour change(s) you observed.

7. Did you consider any unpredicted behaviour change(s) were satisfactory (i.e., positive)?

very dissatisfactory	moderately dissatisfactory	slightly dissatisfactory	neutral	slightly satisfactory	moderately satisfactory	very satisfactory

8. Did you consider the unexpected behaviour change(s) to be

very unimportant	moderately unimportant	slightly unimportant	neutral	slightly important	moderately important	very important

9. For my child the acquisition of the skills were

very unbeneficial	moderately unbeneficial	slightly unbeneficial	neutral	slightly beneficial	moderately beneficial	very beneficial

D. OVERALL INTERVENTION

1. Overall, the intervention was

very unhelpful	moderately unhelpful	slightly unhelpful	neutral	slightly helpful	moderately helpful	very helpful

2. Overall, I was _____ with the intervention.

very dissatisfied	moderately dissatisfied	slightly dissatisfied	neutral	slightly satisfied	moderately satisfied	very satisfied

3. Would you recommend the intervention to a friend or relative?

strongly not recommend	moderately not recommend	slightly not recommend	neutral	slightly recommend	moderately recommend	strongly recommend

E. COMMENTS

Please feel free to comment on any aspect of the intervention not covered above.

_____

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Thank you for your co-operation!