

An Investigation into the Effects of Video Self-Modelling on the Fear
Responses of Children with Autism

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Abstract

The aim of this project is to establish whether video self-modelling is an effective approach in decreasing fear responses in children with ASD aged between five and 15 years. Participants were recruited through a flyer that was posted in the Autism New Zealand Canterbury newsletter and the Autism in New Zealand Facebook page. Three participants were recruited who were aged 11 to 12 years, who had a diagnosis of ASD and a fear. This study used a single-case, AB design replicated across the three participants. The participants met with the researcher to discuss their fear and what the study entailed. Baseline measures were obtained and videos were created to depict the child being in the same environment as their feared stimulus. Participants watched their videos for a two-week period then the baseline measures were repeated twice. Two out of the three participants showed some increase in steps achieved in their fear hierarchies. A similar pattern was found with the self-reported levels of fear, one participant showed a decrease in post intervention measure, the second showed variability and the third was not able to complete the intervention due to his extreme fear response. The results of this study reflect some of the literature, which suggest that while VSM can result in rapid learning, in some cases it may not work for all participants and individual differences can account for some of this variability. Due to the variation in the results and individual differences, it is difficult to determine the effects of this type of intervention for fears and phobias in children with ASD. Limitations on this study included the number of participants, as a larger number would have provided more data on the effects of VSM for different participants and the amount of time that was allocated to complete the study.

Chapter 1: Introduction and Literature Review

Fears and Phobias

Fear enables us to survive by aiding in the avoidance and response to threats (Marks, 1987). Response to threat generally involves three systems: psychological activity, overt behaviour and subject thoughts and feelings. Common childhood fears include the fear of animals, the dark, and medical procedures such as injections. These common childhood fears will typically be outgrown (Davis, May, & Whiting, 2011). Where fear is an adaptive response to a threat, a phobia may be considered an unreasonable response to a stimulus. Phobias are excessive in both intensity and duration and interfere with a person's daily life (Davis et al., 2011). When fears progress to be developmentally inappropriate they can become associated with psychological symptoms and can impact on the individual's behaviour for example by increasing their inhibition or wariness (Evans, Canavera, Kleinpeter, Maccubbin, & Taga, 2005). Childhood fears and phobias affect not only typically developing children, but all children, including those with autism spectrum disorders and developmental disabilities.

A specific phobia is characterised by a disproportionate, irrational fear of a situation or an object, that causes the person to avoid it or endure it with great distress (Choy, Fyer, & Lipsitz, 2007). Specific phobias fall under anxiety disorders in the DSM-5, along with separation anxiety disorder, social anxiety disorder (social phobia) and generalised anxiety disorder. These anxiety disorders share similar patterns of excessive anxiety and fear related behavioural disturbances. The anxiety disorders differ from one another by the types of situations and stimulus that evoke the fear response, avoidance and the cognitive ideation. Anxiety disorders are different from developmentally normal fear as they are excessive compared to the

amount of danger actually posed, and they persist beyond developmentally appropriate periods. For example, an individual with separation anxiety is fearful of separation from their attachment figures and fearful of the possibility of harm to their attachment figures. Individuals with specific phobia are fearful, anxious and/or avoidant of defined objects or situations. The individual will behave in a way to minimise contact, prevent contact, or the feared object or situation will be endured with intense fear and anxiety. For a phobia the fear response is out of proportion to the actual threat or danger posed by the object or situation. To gain a diagnosis this fear response needs to be present for longer than six months, and cause significant distress to the individuals functioning (American Psychiatric Association, 2013). There are many different types of fears and phobias therefore they are categorised by their type. These are; animal (e.g. dogs), natural environment (e.g. heights), situational (e.g. planes), blood-injection-injury (e.g. needles) and other (e.g. people in costumes). To meet the diagnostic criteria in children, these fears need to be developmentally inappropriate.

Autism Spectrum Disorder (ASD)

ASD is a neurodevelopmental condition that interferes with a persons' ability to relate to and communicate with other people (Elsabbagh et al., 2012). Children with ASD may engage in repetitive behaviour, have attention deficits, resist change and be sensitive to sensory experiences (Delano, 2007). As a result of this, the caregivers and educators of children with ASD experience a unique set of challenges (Delano, 2007). ASD is characterised by difficulties in social interaction and communication across many contexts and settings including; social emotional reciprocity, non-verbal communicative behaviours and difficulty developing, maintaining and understanding relationships. In addition to this, children with ASD

may exhibit restrictive, repetitive patterns of behaviour, activities or interests. This includes; fixated interests that are deemed abnormal in intensity, insistence of sameness and routines, hyper/hypor-activity to sensory input and/or repetitive movements, use of object or speech. (American Psychiatric Association, 2013). In order to receive a diagnosis of ASD, these symptoms must be present in the early developmental period but may not become apparent until social demands exceed limited capacities or may be masked by a learned strategy. The symptoms must also cause significant impairment in social, occupational or other areas of functioning and are not better explained by intellectual disability, or global developmental delay (American Psychiatric Association, 2013). Expressions of the disorder may vary greatly depending on the severity of the condition, developmental level and chronological age, hence the term spectrum. ASD can occur with or without an intellectual impairment and with or without language impairment (American Psychiatric Association, 2013). A recent global prevalence study that reviewed epidemiological surveys of ASD reported the median of prevalence estimates to be 62 cases per 1000 children (6.2%) (Elsabbagh et al., 2012) however, prevalence, as reported by the DSM V (American Psychiatric Association, 2013) is 1% of children. It is estimated that in New Zealand there are currently 40, 000 people with ASD (Autism New Zealand, 2014).

Fears and Phobias in Children with ASD

Children with ASD have higher levels of anxiety than typically developing children (Mayes et al., 2013; Mayes, Calhoun, Murray, Ahuja, & Smith, 2011). Compared to typically developing children where estimates range from 5% (Ollendick, King, & Muris, 2002) to 18% (Muris & Merckelbach, 2000), the rates for children with ASD are significantly higher. In one study of over 1000 children with

ASD aged 6 to 16, mothers reported that 79% of high functioning and 67% of low functioning children experienced anxiety (Mayes et al., 2011).

Sukhodolsky et al. (2008) conducted a recent study investigating the frequency and correlates of parent-rated anxiety symptoms in 172 children aged between five to 17 years old, with who met the DSM-IV criteria for autistic disorder. A parent-rated questionnaire was completed that included the Child and Adolescent Symptom Inventory (CASI). The CASI is a behaviour rating scale for DSM-IV-defined emotional and behavioural disorders in children between the ages five and 18 years. This inventory contains 26 items across eight anxiety disorders (generalised anxiety disorder, separation anxiety disorder, post traumatic stress disorder, somatisation, social phobia, obsessive-compulsive disorder, specific phobia and panic disorder). The results showed that 43% of the subjects met the CASI screening cut-off for at least one of these anxiety disorders. In this study Specific phobia, was reported to be the most common type of anxiety experienced by children with ASD, with 31% of participants rating above screening cut off scores. The second highest was social phobia with 19.9%. (Sukhodolsky et al., 2008). Interestingly, Sukhodolsky et al. (2008) also reported that higher levels of anxiety were correlated with a higher IQ, with results demonstrating that children with an IQ above and below 70 produced nearly identical results with alpha coefficients of 0.87 and 0.83 respectively. It is thought that children with a higher IQ may better able to cognitively understand their fears and phobias however, it is important to note that as this used a parent-rated questionnaire to determine anxiety symptoms the correlation could be somewhat impacted by the child's ability to understand and articulate their fears to their parents.

In another recent study, Evans, et al. (2005) examined the fears and phobias of four groups of children; 25 children with ASD, 43 children with Down Syndrome, 45

mental age matched controls and 37 chronological aged matched controls. Parent reports on a fear survey were used to assess the children's fears, phobias, anxieties and problem behaviour. Significant differences were found between the typically developing children and those with developmental disabilities. Participants with ASD were rated as being more fearful than their comparison groups in several areas. Children with ASD were rated by their parents as exhibiting more situational phobias than the comparison groups ($F(3, 146) = 5.91$, $P = 0.001$), and were also rated as exhibiting more medical fears than all other comparison groups ($F(3, 146) = 5.19$, $P = 0.002$) (Evans et al., 2005). It is noteworthy, that this study also used parent questionnaires to rate the child's fear. Given that fears are subjective, the validity of observer reports of these experiences with children who have difficulties in expressive communication may be questioned.

The research has indicated that fears are common in children with ASD and that the phobias are often unusual. For example, steps, toilets, elevators, vacuum cleaners, and balloons have all been cited in the literature. These unusual fears are not those typically seen in specific phobia (Mayes et al., 2013). It is unknown exactly why fears and phobias are thought to be higher in children with ASD however some literature has suggested a possible link between this and the abnormal development of the amygdala (Amaral, Bauman, & Schumann, 2003). There are several pathways and neural structures that are thought to play a role in ASD in the research and the amygdala is one of them (Markram, Rinaldi, La Mendola, Sandi, & Markram, 2008). Current research shows that those with ASD experience difficulties in the interpretation and expression of emotions. The causes of these difficulties are still poorly understood. Current research debates what extent abnormalities in the limbic system, in particular the amygdala have to play in these difficulties displayed in those

with ASD (Gaigg & Bowler, 2007). There has been an alternative view put forward in the research that the amygdala is linked to the abnormal anxiety, fear and phobias associated with ASD (Markram et al., 2008). One study that supported this view looked at the volume of the amygdala of 42 children aged three to 14 years with ASD through magnetic resonance imaging (MRI), and compared this to anxious scores on the Child Behaviour Checklist. This study found that the Child Behaviour Checklist was a significant predictor of the right amygdala and total amygdala volumes. This concluded that this was some brain/behaviour relationship between the amygdala volume and the anxious score on the Child Behaviour Checklist (Juraneck et al., 2006).

Current treatment for fear/phobia in typically developing children

Systematic Desensitisation (SD). SD is recognised in the literature as an effective and empirically supported psychotherapy for a specific problem (King, Muris, Ollendick, & Gullone, 2005). Variants of the traditional form of SD have been developed for children to reflect their developmental stage and cognitive ability (King, Muris, Ollendick, et al., 2005). Emotive imagery (EI) is a variant of SD (Lazarus & Abramovitz, 1962). In its use, EI involves the subject visualising images that give them feelings of pride, affection and self-efficacy. This type of treatment uses narrative stories. An example of this is the use of a hero such as superman to help and guide the child through their fear hierarchy (King, Muris, Ollendick, et al., 2005). Some research has shown that in-vivo SD was more effective than emotive imagery for children aged five to 11 years old however, in-vivo SD and emotive imagery were equally effective for older ages (Ultee, Griffioen, & Schellekens, 1982).

In-vivo SD involves direct and prolonged exposure to the feared stimulus. This can result in apprehension and subsequently, can lead individuals to avoid treatment (Botella, Brenón-López, Quero, Baños, & García-Palacios, 2010). This is

why children may not be treated, in particular because it could be distressing for families to put their child through this, in addition to the stress it causes the child (Botella et al., 2010). It is thought that the majority of people in the general population who are suffering from a phobia never seek treatment (around 60-80%) (Botella et al., 2010).

Cognitive Behaviour Therapy (CBT)/ One-Session Treatment (OST)

Davis, May and Whiting (2011) reviewed 62 empirical studies, which examined phobia treatments for children. This study evaluated the evidence and research for different treatment options for fears and phobias in typically developing children. They concluded that for the treatment of specific phobia, individual cognitive behaviour therapy (CBT) in the form of a one-session treatment (OST) was shown to be well established and the best overall treatment option. OST has been used with a combination of techniques including; participant modelling, reinforcement, psychoeducation, cognitive challenges, and skills training used during graduated in vivo exposure (Ultee et al., 1982). Exposure occurs through a fear hierarchy and allows the researcher to implement the other techniques over a three-hour session. A cognitive challenge includes the clinician asking the child to predict what they think will happen before a step in the hierarchy and then asking the child to describe what actually happened after the step in the hierarchy. The difference between the catastrophic beliefs and actual events are then discussed and highlighted (Ultee et al., 1982). Another technique used during OST is modelling. This includes the clinician modelling a step in the hierarchy and then prompting the child to also complete the step or complete parts of the step in the hierarchy. Reinforcement is used throughout OST in the form of verbal praise and occasional physical contact (Ultee et al., 1982). Psychoeducation and skill training are used to challenge the child's false assumptions

and catastrophic beliefs. They also aide in teaching them skills to overcome their fears such as how to pat a dog correctly so they do not scare it (Ultee et al., 1982). The time it takes to complete the exposure differs for each child and different phobic stimulus. This type of treatment has been mainly used in clinical trials with fears such as spiders, dogs, insects, storms, heights and water with children ranging from 7 to 17 years old (Ultee et al., 1982). This type of treatment has benefits in that being only one session in duration; it requires less time for the parents in travel to and from treatment. It may also be a better model for those who have low motivation and difficulty attending many sessions over time. The treatment however may face some practical limitations such as funding due to it not fitting with the current 50-minute session models. With up to three hours of treatment this may be too difficult for some children to maintain concentration, motivation and may be cognitively exhausting. Further research of this treatment package is needed in order to evaluate its effectiveness with younger children and a range of cognitive abilities including those with comorbid diagnoses.

Current treatment for fear/phobia in children with ASD

Research has highlighted that children with ASD have higher levels of anxiety and more fears and phobias than typically developing children (Mayes et al., 2013; Mayes et al., 2011). While many behavioural treatments have been shown to be effective with typically developing children (Davis, May & Whiting, 2011). There is limited research to allow us to conclude whether behavioural approaches are as effective with different populations, such as children with ASD. It is possible that many common treatments for phobias used with typically developing children may not be applicable for children with developmental disabilities including ASD.

To investigate this area of research a literature search was conducted through the following databases; Embase, Science Direct, PsycINFO, PsycARTICLES and Google Scholar. Key search terms used included fear/phobia and intervention, AND variations on the term autism (e.g., ASD, Autism, Asperger's Syndrome OR developmental disability*). Studies were included if they targeted a specific phobia or fear response and included children with ASD who were between the ages five and 15 years.

Table 1.*The treatments used for fears and phobias in children with ASD*

Author & Date	Participant (Age, sex and Diagnosis)	Fear and setting	Measures	Treatment	Results
Cavalari, DuBard, Luiselli & Birtwell (2013)	Female aged 16, diagnosed with ASD and IDD	Fear of a medical examination, school setting	Completion of each step in a 12-step hierarchy without withdrawal or demonstrating any problem behaviour or aggression.	In-vivo graded exposure, social story and positive reinforcement.	At baseline none of the steps were completed after 57 sessions (over 4months) she was able to complete all of the 12 hierarchy steps.
Chok, Demanche, Kennedy & Studer (2010)	Male age 15, diagnosed with ASD and IDD	Fear of dogs, setting both indoors in an office, and outside school on a grass area s	Heart rate monitor measure BPM and observations of avoidance behaviours.	In-vivo exposure hierarchy with social praise as reinforcement.	Required six sessions to complete all 7 steps in the fear hierarchy in the indoor setting, too and additional 12 session to meet the indoor criteria.
Ellis, Ala'i-Rosales, Glenn, Rosales-Ruiz & Greenspoon, (2006)	Two males aged 4, one with moderate ASD and one with severe ASD	Fear of skin products and creams (sunscreen, antibiotic lotion), home setting	Frequency of avoidance or rejecting responses and accepting responses (collected by two observers). Number of steps completed in a 21 step hierarchy	In-vivo graduated exposure hierarchy, social praise as reinforcement, therapist modelling. Token system with a food reward was employed for one of the participant.	P1, No steps completed during baseline, after 43 trials in 9 sessions he completed all 21-hierarchy steps, sustained at post treatment. P2, No steps completed during baseline, after 23 sessions he was able to meet the 21-hierarchy steps, not sustained at post treatment.
Jackson & King (1982)	Male aged 4 diagnosed with ASD	Fear of flushing the toilet, home setting.	Number of steps in a 9-step fear hierarchy the participant could take with no observable fear responses.	In vivo systematic desensitisation with reinforcement and the use of laughter as an anxiety inhibitor	Child was able to use and flush toilet after 15 days (56 trials) of treatment with no fear response observed. Results were consistent at 3 and 6-month follow up.
Love, Matson &	Two males,	Fear of going	Number of approach steps,	In-vivo graded exposure in	P1, mean of 4.3 vocalisations to a

West (1990)	aged 4.5 and 6 both with a diagnosis of ASD	outside and fear of the shower, home setting.	child's verbalised fear, observer rating on likert scale (1-5) of appearance of fear (5 being most afraid)	step hierarchy, parent modelling.	mean of 0.31 After 20 sessions he was able to reach the back fence and retrieve an item by himself. P2, After 22 sessions for this participant to complete the 22 steps in his fear hierarchy and remain in the shower.
Luiselli, (1978)	Male aged 7 with a diagnosis of ASD	Fear of school bus. Setting was on the bus outside of his house, then on the bus outside of the school, then traveling on the bus	Observation/behaviour and ability to complete the trip from home to school on the bus.	Systematic in-vivo exposure to the feared stimulus with reinforcement (from mum).	Was able to complete the trip from home to school on the bus with no fear after 7 days of treatment. The participant was still riding the bus at the 1-year follow up.
Luscre & Center (1996)	3 Males aged 6, 9, 9, diagnosed with ASD	Fear of dental examination, analogue setting in school and in-vivo at an actual dental office.	Number of steps achieved in the hierarchy. Mastery was 3 consecutive sessions.	Desensitisation with guided mastery, Video peer modelling , reinforcement and antianxiety stimuli.	Sessions to achieve all 13 hierarchy steps P1, 24 sessions analogue, 6 sessions in-vivo. P2, 16 sessions analogue, final hierarchy step 13 not completed in-vivo. P3, 19 sessions analogue, only able to complete up to step 10 in-vivo.
Rapp, Vollmer & Hovabetz, (2005)	Female aged 14 ASD sever IDD	Fear of pool/water, setting was at the public swimming pool.	Observations of problem behaviour (PB) including; elopement, flopping, face hitting and screaming.	Changing criterion reinforcement and blocking plus reinforcement for approaching pool (needed 3 therapist).	Mean instances of PB decrease from 4 per min at baseline to 0.17 during session 7. At a 10 month follow up her PB had recovered to baseline level, after 2 session her PB was reduced again to 1.26 and 0.39.
Ricciardi, Luiselli & Camare, (2006)	Male aged 8, diagnosed with ASD	Fear of animatronic objects (moving toys), clinic setting.	Proximity to stimulus in meters	Contact desensitization, Exposure hierarchy	During baseline he never moved beyond the entrance of the room (6m) after 18 sessions he was able to

Shabani & Fisher (2006)	Male aged 18, with a diagnosis of ASD, IDD and diabetes	Needle Phobia, clinic setting,	Percentage of successful trials (he did not move his arm more than 3cm during the trial, if he did trial was terminated)	In-vivo desensitisation and positive reinforcement.	stand 1m away from the animatronic object. During baseline he withdrew his arm every trial, after 30 sessions he remained still while blood was drawn.
Wilson & Jackson (1980)	Males aged 5, diagnosed with ASD and borderline IDD	Toilet phobia, school setting	Number of steps achieved in a 22-step hierarchy.	In-vivo desensitisation and positive reinforcement after each successful trial.	Treatment took 33 days for the participant to complete all 22 steps.

As Table 1 indicates, nine studies were identified which used systematic desensitisation for the treatment of phobias among children with ASD. All of the 11 studies reviewed used some form of in-vivo exposure through systematic desensitisation (SD). The majority of the studies used the number of steps completed in the participants fear hierarchy as the outcome measure. Overall the findings indicate that although most of the participants were able to increase the number of steps taken in their hierarchy there were some limiting factors to the use of SD. The main, and most concerning limitation of this treatment is that all of the participants were put under stress through the ongoing in-vivo exposure to their feared stimulus. Results of this review indicate that systematic desensitisation may not be appropriate for children with ASD, as used in its traditional form as SD requires the child to have the cognitive ability to undergo relaxation training (Wilson & Jackson, 1980). Only one study used any form of relaxation techniques. Jackson and King (1982) used tickling and laughter as a form of relaxation and as an anxiety inhibitor for a four-year-old boy with ASD and a fear of flushing toilets. For this intervention a fear hierarchy scale was developed. At each step in the hierarchy the child received reinforcement from the mother in the form of verbal praise and then was tickled to reduce his phobic responses. The hierarchy consisted of 9 steps and it took on average 2 days to master each step. The boy was then able to complete all steps in his hierarchy and was able to flush the toilet. At the three and six month follow up the child was still symptom free and the treatment had generalised to other toilets (Jackson & King, 1982). This type of intervention was successful in being able to eliminate the phobic response in a short period of time (15 days). The study was the only one that used an anxiety inhibitor in the research but it is difficult to determine to

what extent the change can be accounted for by using tickling to reduced anxiety, and to what extent the use of reinforcement while working through the hierarchy could account for the change.

In-vivo exposure to the feared stimulus with reinforcement either for direct contact or gradual approximations appears to be the favoured treatment to reduce fear/phobia in young children with ASD (Wilson & Jackson, 1980).

Luiselli (1978) used in-vivo systematic exposure to the feared stimulus with reinforcement in order to treat a 7-year-old boy with ASD who had an intense fear of riding on a bus. The treatment lasted seven days. On the first two days the child's mother was on the bus and the researcher took the child onto the bus. Praise and food were used as reinforcement for the child for staying on the bus and remaining calm. The child's mother was faded out by standing beside the bus outside his window on day three, and waiting in her car where the child could see here on day four. On the days five and six the bus made short journey's, from the school to the car park, which then lengthened in duration. On the seventh day the child was placed on the bus by his mother and he rode the entire trip to school alone. Prior to treatment, the boy would not board the bus and would engage in tantrums. After treatment, he was able to ride on the bus to school independently with no distress (Luiselli, 1978).

Ricciardi, Luiselli and Camare (2006) also recorded success with this method. Their participant was an 8-year-old male with ASD who was diagnosed with specific phobia of animatronic objects (electronic animated figures). After 15 sessions of systematic desensitisation and reinforcement the boy was able to get from 6 meters from the feared stimulus, to being able to approach and touch the electronic toy when prompted. Three months following treatment the mother reported that when they

entered a store that contained animatronic toys the child occasionally protested but tolerated the stimulus without escape (Ricciardi, Luiselli, & Camare, 2006).

Chok, Demanche, Kennedy and Studer (2010) also used in-vivo systematic desensitisation and positive reinforcement when treating a dog phobia in a 15-year-old male with ASD. This study measured both his physiological arousal, through heart rate monitoring. In this study, the child was asked to walk as close as he could to the dog and once he displayed behavioural avoidance (stopped walking, started backing up) his heart rate was taken. The measurement between him and the dog were recorded and he was able to go back inside. In-vivo exposure was used with the treatment progressing through gradually reduced proximity to the dog (150ft/45.7m). The participant was prompted by the researcher with the phrase “Bill lets go for a walk”, then they provided continuous praise while he walked towards the dog. If he stopped walking they waited with him for two minutes and then took his heart rate. If the heart rate was less than 90bpm, he was encouraged to keep progressing. If it was above 90bpm the authors gave a verbal prompt “lets wait here” until his heart rate fell below 90bpm. If he made a step back from the dog the session was terminated. The participant was able to achieve all of the seven steps within six sessions when applied in an outdoor setting. In the indoor office setting the participant required an additional 12 sessions to meet all of the criteria. This study is unique in that it measured the fear as a multi-factorial response by taking into account both the physiological arousal and the behavioural response. This study was also unique in that it training the participant to wait and calm down and reduce his heart rate to below 90bpm if he became distressed. One of the limitations of this study was that it did not conduct a comparison between the multiple treatment conditions. It would have been valuable to attempt to identify which components of treatment package were effective i.e.,

whether the physiological criteria had a greater impact on the treatment outcomes than the behavioural approach alone (Chok, 2010).

In conjunction with in-vivo gradual exposure, parent modelling has been used to reduce fear responses and encourage children to continue in an approach step desensitisation programme. Love, Matson, and West (1990) used in-vivo gradual exposure with two boys with ASD aged four and a half and six years old. The intervention consisted of prompting the children to slowly move closer to their feared stimulus using parent modelling to encourage their child to continue during an approach step desensitisation programme. For one child, the phobia was the shower and for the other child it was going outside alone. Through reinforcement and modelling from the mother, both children reduced their levels of anxiety and fear responses including verbalisations of their fear and increased their number of approach steps. For the first participant the verbalisations were reduced from a mean of 4.3 to a mean of 0.31. It took 20 sessions for him to be able to reach the back fence and retrieve an item by himself. The second participant, who had phobia of showers, was able to tolerate the shower for 30 seconds or longer after 14 treatment sessions and remained in the shower for up to 5 minutes on several sessions. It took 22 sessions for this participant to complete the 22 steps in his fear hierarchy.

One study used video peer modelling, desensitisation and reinforcement with three male children aged six to nine years with a formal diagnoses of ASD (Luscre & Center, 1996). Four typically developing peers acted as the models in a video of a dental exam conducted in a real dental office. An analogue dental office was set up at the participants' school, with a reclining chair, dental tools and a light stand to mimic a dental office. The participants watched the video in this setting. Subject two attended well to the video, subject one show sporadic interest and subject 3 glanced

anxiously at the video with his peripheral vision after they had visited the actual dental office twice. The investigator used a start stop (show, then do) procedure to coordinate the presentation of dental instruments with those shown on the video. The researcher then verbally encouraged the participants and through physical assistance helped complete the dental procedures modelled in the video. After compliance of each step, reinforcement was given in the form of music, fruit, play-doh and a hand held mirror. When criterion was reached on each step, that step was then probed in-vivo in the real dentist office. Subject one was able to sit in a dental chair in-vivo after three analogue treatment sessions. The goal of sitting through a dental exam was reached after 24 analogue sessions for this subject. Subject two was able to complete the first 9 steps in the hierarchy in-vivo (out of 13) after four analogue sessions. He was able to complete the full hierarchy in the analogue setting after 16 sessions but refused the complete exam from the dentist in the in-vivo setting. Subject three was able to complete the full hierarchy in the analogue setting after 19 treatment sessions. Subject three allowed a partial exam by the dentist during the in-vivo setting he was only able to complete up to step 10 (acceptance of a dental mirror). Due to the school year ending the researcher could not continue treatment to see if any further gains could be made. This study showed positive gains for these three children but stopped due to the school year ending. It would have been interesting to see if participant three continued to make gains as he was improving when the intervention finished. The studies reported above have shown some promising results, as the children have been able to reduce or overcome their fear responses. However, the children in these studies were all subjected to prolonged exposure to their feared stimulus. In-vivo exposure to the stimulus has also been criticised as it is shown to increase fear

responses in children. This method can therefore, cause additional stress and anxiety for some participants (Love, Matson, & West, 1990).

With the exception of Chok, et al. (2010), the studies reviewed have demonstrated treatment success by establishing an approach method to the feared stimulus but in doing so, it is not measured whether the reflexive anxious response is still evident during the approach. Chok, et al. (2010), was the only study that looked at the physiological response and found that this was often evident during the behavioural approach. Therefore future research should take into account other measures of fear responses instead of only using the behavioural approach.

The research on phobia/fear and children with ASD and typically developing children is limited; there are very few studies that target this area of research. In addition, some of the treatments appear out-dated as earlier studies use techniques that may not be ethically appropriate for current standards. However, one treatment which ethically sound and is emerging for the treatment of phobias and fears in typically developing children is the use of video modelling (VM) and video self-model (VSM).

Video Modelling (VM) and Video Self-Modelling (VSM)

Observational Learning and Modelling. Bandura (1977) argues that we learn from observing what others do. Modelling is an instructional form of teaching that is derived from social learning theory. This theory is based on the principles of observational learning. Bandura stated that there were four main processes involved in observational learning. Firstly, attentional processes regulate exactly what is selectively observed. Secondly, retention processes involve being able to hold what the person observed in their mind in order to be able to imitate it. This involves holding the information in memory in a symbolic form. The third is motor reproduction processes that involve the conversion of the symbolic representations

into appropriate actions. To achieve these actions, the individual must already possess the appropriate motor skills. Finally, for motivational processes, there must be enough reinforcement to motivate the performance. Through the 1970's the developing literature focused on observational learning and this research highlighted that the closer the model resembled the observer, the greater the modelling effects were, thus the self was considered to be the 'ultimate' model (Dowrick, 1999).

Video Modelling and Video Self-Modelling. Video modelling (VM) involves an individual watching video footage of a model or peer engaging in targeted behaviours/skills with the aim of teaching the individual the behaviour/skill (Burton, 2013; Cihak, 2011; Dowrick, 1999). A VM intervention typically involves the participant watching a video of the model and then imitating the behaviours of the model (Burton, 2013; Cihak, 2011; Dowrick, 1999). Bandura affirmed that children are most likely to attend to the video if the model resembles them in some way (physical characteristics, age, gender etc.) and proposed that the self would be the ultimate model (Bandura, 1977, 1997).

Self modelling is when images of the individual engaged in adaptive behaviour are used to teach that individual (Dowrick, 1999). Bandura affirmed that a main advantage of self-modelling is seeing oneself accomplish the task at hand. This both provides information on how to perform the skill and gives the individual self-efficacy and a strengthening of their beliefs about their capability of undertaking the skill/task. Through observing oneself the person can learn skills, or adjust to different environments.

There are a number of ways to produce a self-model. Self-modelling can be produced through photographs, audiotapes, role-plays and imagination, but the most common form is a 2-4 minute video (Dowrick, 1999, 2012). Dowrick (2012) noted

that the desired behaviour or skill being taught through VSM needs to be within the individual's zone of proximal development. This means that the skill or behaviour is achievable as the subject has the component parts of the skill in their repertoire, but it is just beyond their current ability, or they are unable to put the component parts together in the right sequence (Dowrick, 1999, 2012).

Dowick (1999) reports there are two different types of self-modelling; positive self-review and feedforward. Positive self-review is a type of VSM that is used for tasks or behaviours that are within the individual's repertoire but are not being performed at a desirable rate. The VSM video is edited to show the individual performing the behaviour or skill at the desired level (Dowrick, 1999, 2012). This type of VSM is useful for rarely exhibited or a newly learned skill. When shown on video the individual can observe it frequently and therefore, through the positive self-review process the non-performed behaviour can become more established (Dowrick, 1999, 2012).

Video self modelling using feedforward involves creating an image of success that depicts achievement outside of the individuals level of ability (Dowrick, 2012). However, the component behaviours that make up the target behaviour or skill need to be already apart of the individual's repertoire (Dowrick, 2012)(Dowrick, 2012). In short, VSM using feedforward are created by editing together component parts of the skills or behaviour that an individual is able to do and to depict them performing the target skill or behaviour competently (Dowrick, 1999; 2012) Alternatively, the target behaviour/skill can be placed in the desired context cinematically. Dowrick (1999; 2012) notes that feedforward can result in behaviour change that is 'remarkably rapid' as the skills and behaviours are within the individual's ability and are just reconfigured to enable the individual to perform the new skill or behaviour. Dowrick

(2012) suggests that the extremely fast change in behaviour can be somewhat attributed to mental time travel and mirror neurons. He described mental time travel as the ability to both remember and anticipate and to foresee and plan future events. It is posed that people can predict consequences of events that they have not experienced by simulating those events in their head. Mirror neurons have also been suggested as a neurological basis to inform self model theory. The function of mirror neurons are to assist in the perception of others intentions and to imitate others actions. Learning through VSM produces a cognitive self-stimulation that can then be access in the future to trigger the correct behavioural response in the correct context.

Self-efficacy. Self-Efficacy is another important aspect of social learning theory. Bandura (1997) defined self-efficacy as the beliefs people have about their capabilities that influence how people think, feel, motivate themselves and behave. According to Bandura self-efficacy can be acquired through external support, encouragement and through the observation of oneself. When children are successful at completing a task, and if they attribute this success to their abilities, they develop self-efficacy. This is the belief in one's ability to effectively perform at a similar task in the future. To make a behavioural change, people need not only knowledge and the required skills but also a belief in their own agency (Cervone, 2000).

Video Self-Modelling (VSM) and teaching children with ASD

Video Self Modelling (VSM) has been used successfully with children with autistic spectrum disorder (ASD) to teach social and communication behaviours, perspective taking skills, functional living skills and also in the management of challenging behaviours, such as tantrums (Delano, 2007). Video self model is thought to be effective with children with ASD as these children appear to have strengths in visual processing, therefore, many learning strategies with children with ASD are

based on visual cues (Delano, 2007). The literature suggests that VSM is associated with three main benefits for the individual. Firstly, VSM provides a competent performance for the individual to learn from. Secondly, VSM shows the individual that they are able to perform the targeted behaviour and lastly, VSM increases the individual's motivation and self-efficacy (Bandura, 1997; Delano, 2007; Dowrick, 2012).

Video Modelling to Teach Functional skills. Video modelling has been used to teach children with ASD a range of functional skills. One study that looked at the effects of functional skills and the use of video modelling was that of Shipley-Benamou, Lutzker and Taubman (2002). Three children aged five years were included in the study, all with a diagnosis of ASD. The functional skills taught were making juice, setting the table, feeding pets, cleaning a fish bowl and putting a letter in the mail box. Video footage was taken from the model's perspective, that is the models hands completing the task. Once the child viewed the video they were given the items to complete the target task. The results showed that this type of instructional video modelling was effective in promoting skill acquisition across all three participants and was maintained throughout the non-video phase and in a one month follow up (Shipley-Benamou, Lutzker, & Taubman, 2002).

Charlop-Christy, Le and Freeman (2000) compared video modelling to in-vivo modelling for teaching developmental skills such as expressive labelling, independent play and self-help skills with five children aged between seven to 11 years with ASD. These authors found, overall, that video modelling produced faster acquisition of skills compared to observing the models live. For one of the participants there was no difference in rate of skills acquisition for the in-vivo and the video condition. For three of the participants there were twice as many presentations to reach the in-vivo

criterion compared to the VM. The final participant was able to complete the video criterion after two presentations but took 11 presentations to reach the in-vivo criteria. This study indicated that VM resulted in faster acquisition of a range of skills in four out of five participants. Video modelling also promoted generalisation of these skills across people and settings where as the in-vivo condition did not.

Video Self-Modelling as a Behavioural Intervention. VSM interventions have been used to change some inappropriate classroom behaviour but there is less evidence for VSM demonstrating effectiveness with other behaviours outside the classroom. Coyle and Cole (2004) used a VSM intervention to decrease off task behaviour in the classroom with three male students aged between 9 and 12 years. Off task behaviour were those deemed unnecessary to the task at hand, which included; looking around the classroom, leaving their seat, playing with pencils or other objects (Coyle & Cole, 2004). Off task behaviour was measured through time sampling. The intervention resulted in a marked decrease in the mean of time spent off task from 25.5, 25.9 and 25.8 to 1.6, 5.5 and 1.5 seconds respectively and these behaviours were maintained during the follow up period.

Buggey (2005) used VSM interventions with children who had ASD across a variety of behaviours including language, social initiations, tantrums and aggression. The participants involved in this study were aged from 5 to 11 years and their level of ASD ranged from mild Asperger's syndrome to moderate autism. Social initiations were the target behaviour for both an 11-year-old boy and a nine-year-old boy. Social initiations were identified as unsolicited verbalisations to either a peer or staff member. The participant watched his three-minute VSM everyday for 10 school days, during which observation data was obtained. The first participant made no social initiations during a two-week baseline phase, but during the intervention and

maintenance phases the mean number of interactions increased to 4.0 and 4.4 per day respectively. The nine-year-old boy had two social initiations during the 12-day baseline; this increased to an average of 3.8 during intervention phase and increased again at the maintenance phase to 4.25 interactions.

Tantrums were the target behaviours for two boys aged 6 and 8 years old. The VSM for this behaviour included the boys acting out a script of a situation that would typically result in a tantrum but instead, the students were asked to act polite and friendly in these situations (the participants had no negative reactions to this filming). For the first participant the mean time spent in tantrums was reduced from 16.25 minutes during baseline to 1.6 minutes during intervention and 2.8 minutes during the maintenance phase. For the second participant, tantrums decreased from a mean of 19.3 minutes during baseline to 4 minutes per event in intervention and reduced again to 2.3 minutes during the maintenance phase.

Both pushing and language production were targeted in one boy aged 5 years. The number of times he pushed another student in class and the frequency of unsolicited utterances and response to questions were measured. This participant did not have the ability to perform a role-play so footage was taken over three days and of this a two and a half minute video of appropriate behaviour was made from this footage. For this participant the VSM resulted in a rapid decrease in the pushing behaviour. After watching his video once there was only one incident of pushing, and this was maintained during the follow up phase. The language intervention was not as effective as only after one week of intervention no increase was observed. After review, the VSM was edited to be simpler including only three questions but more responses from the participant. This resulted in more success with the participant increasing his verbalisation from zero in baseline and the first VSM to a mean of 3

during the second VSM intervention, this increased to a mean of 4.67 during the maintenance phase (Buggey, 2005). This study used VSM successfully for a range of target behaviours for almost all of the participants. The VSM intervention that occurred at the start of every school day seemed to have resulted in positive changes throughout the school day. The VSM intervention was relatively non intrusive for the students and teachers, with the VSM viewed before class time so the students did not miss any instructional time. The teachers gave positive reports about the use of VSM and noted that the parents of the children who targeted tantrums contacted her to comment on the positive changes seen within the home setting.

VSM as a social skills intervention. Several studies have looked at the benefits of VSM for teaching children with ASD social skills. Bellini, Akullian and Hofp (2007) used feedforward VSM to increase social engagement with peers in two boys aged four and five years, diagnosed with ASD. The video footage was taken of the children being prompted to engage their peers then the prompts were edited out of the footage so it appeared in the video that the children were initiating peer interactions without prompting. The dependant variable was the number of unprompted social interactions/engagements with peers during observations. The results showed an increase in the mean percentage rate of unprompted engagement with an increase of 43% for the four-year-old boy and a 24% increase for the five year old boy. These increases were maintained after the VSM intervention had been withdrawn.

Buggey, Hoomes, Sherberger and Williams (2011) also used feedforward VSM to increase social interactions with peers during playtime. This study was conducted with four children aged from three to four years with moderate to sever ASD. Social interactions were measured through three observers. The children's minimal interactions were recorded and the children were coached to imitate simple phrases

such as “let’s play”, all of the children’s VSM had short clips of the children transitioning from the classroom to the playground and them playing on the playground equipment with their peers. The participants watched their VSM for a period of two weeks. The results showed that two of the participants showed a significant increase in the mean number of social interactions going from a mean of 1.14 and 0.19 to a mean of 4.33 and 3.73 respectively. However, the third participant had some variation and questionable results and the fourth participant showed no change. The participant’s score remained consistent during the maintenance phase, however this was recorded immediately after the intervention ended and there was no follow up. Anecdotal information stated that other forms of improvement were also noted by the teachers, therapist and observers such as children moving to different areas of the playground and using different equipment that they had not tried prior to the intervention. The participant who did not make any change throughout the intervention attended well to the video and clapped after he watched his VSM. As he was the youngest participant (three years 10 months old) the researchers questioned his age, maturity and developmental level as some of the possible reasons of why this intervention was not successful with him (Buggey, Hoomes, Sherberger, & Williams, 2011).

One review (Delano, 2007) examined the empirical evidence of using video modelling with children with ASD including self and peer modelling. This review found that the data of the 19 studies reviewed indicated that video modelling resulted in positive gains in social, communication and functional skills. However, five of the studies reviewed had mixed results, and all of these studies used peer models rather than a self-model. Video modelling was found to be effective in multiple settings such as the home, school and community settings. Video modelling was also shown to be

useful in improving communication skills, social skills and challenging behaviours. One benefit of VM in children with ASD is that VM has been shown to result in generalisation across people, setting and materials; this is often not attained through traditional prompting methods (Delano, 2007). Delano (2007) concluded that although there were positive gains made by video modelling, video self-modelling might be more successful for children with ASD for several reasons. Firstly, watching a video may help the children ignore irrelevant cues and help the child focus on the skills at hand. Secondly, watching the video demands no social interaction from the child (Charlop-Christy, Le, & Freeman, 2000). Thirdly, this method presents information in a visual format which may be reinforcing to the child and keeps them engaged in the task (Delano, 2007).

The researchers that reported mixed findings suggested that this may be due to individual characteristics of the children with ASD such as; visual processing skills, cognitive ability, language skills, motivation and challenging behaviour (Charlop-Christy et al., 2000; Delano, 2007; Plavnick, MacFarland, & Ferreri, 2014; Rosenberg, Schwartz, & Davis, 2010). Delano (2007) recommends that future research targets intervention goals that result in socially important changes. Of the studies reviewed only four had procedures to identify meaningful intervention goals for the participant(s). Finally, an important direction for future research is determining which method; VM or VSM is more appropriate for the different characteristics of children with ASD. Researchers have suggested that children with challenging behaviours may have difficulty with imitation (Nikopulous & Keenan, 2003, as cited in Delano, 2007). Sherer et al. (2001, as cited in Delano 2007) reported anecdotally that the children who responded best to the VM intervention had higher visual learning skills compared to the other children in the study.

VSM as an intervention for dog fears in typically developing children.

One study that has shown promising results in this area is the Swney's (2013) study that measured the effects of VSM on three typically developing children, aged 7, 9 and 13 years, with dog fears. In conjunction with VSM, this study also taught the children appropriate dog safety techniques and dog body language identification skills. After a baseline, the participants were taught relaxation techniques. On different days, the child and the dog were filmed separately in a location of their choice. This was a setting where they enjoyed spending time but avoided due to the possibility of encountering dogs, their feared stimulus. For the older participant this was the local beach and the two younger participants chose community playgrounds. Videos were then edited to depict the child being in the same environment as a dog and using relaxation techniques previously taught. The participants also received an information booklet on how to correctly read dog's body language. Over two-week period participants read their safety book and watched their VSM video at least six times. Post intervention measures were completed at the same location as the filming where the children were exposed to two dogs in-vivo and asked to rate their fear. The results showed a decrease in fear in two of the three participants with the other remaining participant reporting variable fear levels. A main strength of the method employed in this study was that the children were not exposed to the phobic stimulus until they were comfortable to do so, making the intervention less stressful and more acceptable to the participants. The participant's were also able to choose their video setting and scenarios, making it significant to them. One limitation of this study was that it is difficult to determine whether it was the book, the video or the combination of the two that resulted in the reduction of fear responses. Ethically, there needed to

be a book as this had the function of teaching how to be safe around dogs and 'read' accurately dog behaviour.

While this type of intervention has not been tested with children and young people with ASD, there have been a range of VSM interventions teaching functional skills in children with ASD which show that this is an effective method of learning for this population (Delano, 2007). This study will further extend the Swney (2013) by employing the method with a different population, including measures such as the BAT.

Summary and aim. The literature has indicated that although children with ASD have a higher number of fears and phobias compared to typically developing children (Mayes et al., 2013), research on the treatment of fears and phobias have been directed towards typically developing children. Some research has shown promising results for the use of SD in children with ASD, but this has also been criticised due to its use of in-vivo exposure and the prolonged stress this places on the child (Love et al., 1990). The Swney (2013) study used VSM as a less aversive form of intervention for typically developing children with a fear of dogs. An extensive amount of literature supports the use of VSM as a teaching tool for children with ASD as VSM has been used to successfully teach functional, behavioural and social skills (Delano, 2007). Therefore the current study proposed that VSM might be an effective treatment for fears and phobias in children with ASD, as it is less aversive than in-vivo exposure. The aim of this project was to establish whether video self-modelling is an effective approach in decreasing fear responses in children with ASD aged between five and 15 years of age.

Research Question(s)

The following research questions were investigated.

1. What were the effects of video self-modelling on the treatment of fear responses among children with ASD?
2. Does video self-modelling have an effect on self-efficacy in the treatment of fear responses among children with ASD?

Chapter 2: Method

Experimental Design

This study used a single-case, AB design replicated across participants. Performance post intervention was compared to the individual's baseline measures. Single case designs show repeated measures of the independent variable over the intervention and follow up phases. The data is recorded and presented graphically which allows for visual analysis of the data. Conclusions regarding trends and the relationship between the dependent and independent variables can be then made (Horner et al., 2005). Data variability refers to the variability or consistency of the data points over the repeated measures. The trend of the data refers to patterns (increases/decreases) in data over the repeated measures (Horner et al., 2005). By using this research approach each participant served as their own control and their post measures were compared to their baseline performance.

Ethical Considerations

Prior to recruitment, ethical approval was obtained from the University of Canterbury Human Ethics Committee (refer to Appendix A). Before consenting, the participants and their parents were provided an information sheet outlining the study and its requirements (refer to Appendices B, C and D). On agreement to participate, the parents and the participant gave informed consent (for a copy of the consent forms please refer to appendices E, F and G). Pseudonyms were used to maintain the anonymity of all participants. To ensure the participants felt safe at all times, parents were requested to be present during all phases of the study.

Recruitment and Informed Consent Process.

Recruitment of participants occurred over a five-month period. In order to support recruitment, the researcher contacted Autism New Zealand Inc. and the Autism in New Zealand Facebook page facilitator. Autism New Zealand Inc. is a nationwide service that provides support, training, advocacy, resources and information to parents and families on Autism Spectrum disorders including Aspergers Syndrome. A representative for the Canterbury branch was contacted and asked if a research flyer could be put in the monthly newsletter that went out to parents and families with children and adolescents with ASD. This flier provided information about the researcher and brief information about the aims of the study. Inclusion criteria for the study, such as age range, diagnosis, verbal ability and fears were included. Parents were invited to contact the researcher for further information if their child met the criteria and/or they were interested in participating in the study (see appendix H for the full flier). The Autism in New Zealand Facebook page is a parent networking and sharing site for parents and caregivers caring for someone with ASD. The facilitator of the Autism in New Zealand Facebook page was asked to post the recruitment flyer on their Facebook page for parents to view. Families were able to respond to the advertisement by either phoning or emailing the researcher if they were interested in participating in the study. During the first contact, families were asked to provide an email or postal address where the information sheets and consent forms could be sent. Once the family had received and read this information they were asked to contact the researcher with any questions and further information regarding the study. Informed consent was sought at this time. Upon receiving the signed consent forms, the researcher then conducted an eligibility interview over the telephone at a time and day suitable to the parent. The eligibility interview included

demographical questions about the individual's and question about their diagnosis of ASD or Asperger's syndrome, their verbal ability and information about their fear or phobia. For a full list of the questions please refer to appendix I.

Criteria for Acceptance. Participants were included in the study if they met the following four criteria; (1) had a formal diagnosis of ASD or Asperger's, (2) had a fear or phobia, (3) were between 5 and 15 years of age, and (4) had the verbal ability to use 4-5 word utterances. Participants were selected in order of presentation. If a participant did not meet these criteria, they were thanked for their interest and a selection of support services for fears was provided to the parent.

The fear or phobia was determined by the parent responses to the initial telephone screening interview which included questions such as "Has there ever been a time where your child has not reacted to a...?", "Is there always some level of fear response expressed when your child encounters a...?" These responses were further explored during the initial interview as additional information concerning their child's experiences with their fear stimulus was collected.

Participants. Three participants were included in this study; they were aged between 11 and 12 years, and all had a formal diagnosis of ASD, each of the participants were diagnosed by either a clinical psychologist or paediatrician. The participants and their parents both reported on their feared stimulus.

Participant and Setting Profiles

Alan. Alan was a 12-year-old boy with diagnosis of high functioning ASD and a fear of dogs. Alan had no language difficulties. Alan's mother reported that when he was at preschool a dog ran closely past him at the beach, giving him a huge fright. Now, when Alan sees a dog in the distance he becomes alert and if the dog gets close to him he responds with high pitch squeals, he shouts, he clings to his

mother and/or moves behind her to feel safe. Alan and his mother chose a large open park used for walking and biking as the setting of his self-model video as they had previously experienced a dog off a lead at this park and this was very distressing for Alan. Alan's mother indicated that none of the Questions About Behavioural Function (QABF) ((Paclawskyj, Matson, Rush, Smalls, & Vollmer, 2000) items reflected why he engaged in the fear response behaviour. She commented that she believed that he moved closer to her for safety and comfort when in the presence of a dog. As Alan identified a fear of dogs there were ethical considerations associated with his safety as well as the safety of the dogs during the baseline and intervention phases. The dog used for this intervention was professionally trained and had met Trainimals, (a dog and owner training company) behavioural criteria as being safe and well socialised around children. The dog was under the control of its trainer at all times.

Casey. Casey was an 11-year-old girl with a diagnosis of Asperger's and a phobia of tissues. Casey had no language difficulty that impaired her ability to be in the study. Casey's mother reported that she had many sensory issues with intolerance to certain smells, such as bananas and rubbish bins. When Casey was 7 years old she used a soothing tissue with a eucalyptus scent and this is when her mother believed her fear arose. Over time, Casey's fear has spread to include similar products such as serviettes and toilet paper. Casey will actively avoid tissues and verbally state that she is allergic to the tissues, serviettes and toilet paper. Casey's mother reported that she would use handkerchiefs to blow her nose, uses wet wipes on the toilet after defecating and would use nothing if urinating. Casey's mother and Casey chose their home to be the setting of her self-modelling video as this setting was where she was most likely to use a tissue. Casey's mother indicated on the QBAF Casey will engage in the fear response behaviour when she is physically uncomfortable and will

continue in the presence of the tissues. The QABF score as reported by Casey's mother, indicated that the function of Casey's behaviour was avoidance and escape from using tissues.

Paul. Paul was a 12-year-old boy who had a fear of electric beaters. Paul has limited language. His mother helped him complete the measures. Paul's mother reports that at the end of the 2010 school year, Paul's class had a shared lunch. During the shared lunch an electric beater was used to whip cream for pikelets. Paul said he didn't want any cream but he was told he had to eat this. He became very upset (e.g., cried and screamed) and since this time he has had an intense fear of cream, egg beaters, and mixing bowls. When Paul's mother gets out items to bake he will get distressed and repeat to his mother "no mixing". His mother reports that when he sees a beater he will become really distressed, his breathing will become short and rapid and he will shout "no beater" "no cream". Paul responds in two ways. He will either go over to his mother and shout at her to put the beater away or he will become distressed, yell at his mother to put the beater away but then leave to go outside. Until recently there was not an electric eggbeater in the house but since 2014 his mother is now able to bake as she talks about how the mixture is stirred (instead of beating) and uses a spoon and bowl to do this. Paul is able to cope with this by leaving the house and playing outside but he will come and peak around the corner to see when his mother has finished baking. His mother noted that he is happy to eat the cake and he understands that this is the end point to the process. Paul has no other reported fears but has some anxiety around the lights and television being turned on. Paul's mother indicated on the QABF that his behaviour was to escape the presence of an electric beater. She also indicated on the QABF item 'engages in the behaviour

when he is physically uncomfortable' stood out the most to her and noted that when there is a beater being used Paul is physically distressed.

Materials

The following materials were used in this study. The video equipment included a camera, tripod to film the scenes and shots for the video self models (VSM). The video footage was then edited on an Apple MacBook computer using the editing tools on iMovie software. The following equipment was used as the feared stimulus for each of the participants. Alan's VSM was filmed using a professionally trained Border Collie called Dits from Trainimals. Trainimals is a company that trains dogs and helps owners to understand their dog's behaviour. The Owner of Trainimals holds a Masters Degree and is qualified in New Zealand as a dog behaviour specialist. A box of unscented tissues was used for Casey's VSM while a standard hand-held electric eggbeater was used for Paul's VSM. Alan also received a Dog Safety Booklet that was developed for the Swney (2013) study. The book contained information about dog behaviour and dog safety. The Dog Behaviour and Safety book was written in a child friendly manner and included coloured pictures of dogs displaying different emotions.

VSM Production

For each of the participants a VSM was created depicting them being in the same environment as their feared stimulus and appearing to cope well with this situation. The follow describes the content of each of the participants VSM.

Alan. Alan's VSM consisted of two scenes. In the first scene Alan and his mother were walking through the park and they see a lady walking her dog far away in the distance. The camera switches to what looks like Alan's perspective and they walk past the dog and its owner. There is a voice over of Alan saying "I can see the

dog is on a lead so it will be ok” and then there is a shot of him and his mum walking towards the camera while smiling and you can see in the background the dog and its owner still walking away in the opposite direction. The second scene is similar, however, there is a shot to look like it is from Alan’s perspective and a voice over of him asking the owner if it is ok to pat the dog, the owner replies ‘yes you may pat the dog’. This is followed by a close up of the researchers (too look like Alan’s hand) patting the dog with a voice over of Alan saying, “thank you”. This then cuts to a shot of Alan and his mother walking away from the dog and his mum praising him for remaining calm and then they both get into their car to leave the park.

Casey. Casey’s VSM started with a short frame of Casey sneezing and then saying ‘I need a tissue’. The next frame was of her walking towards a tissue box with her hand stretched out. This was followed by a close up shot of a hand (Casey’s sister) pulling a tissue out from the box. Then, there was a shot of Casey bringing a white piece of paper up to her face (to look like a tissue) and then a close up of her sister’s nose and mouth as she blew her nose with a tissue. After this, there was a frame of Casey putting some screwed up paper (to look like used tissue) into the rubbish bin and an end shot of Casey smiling while her mum praised her for using the tissue.

Paul. Paul’s VSM started with a frame of his mother in the kitchen saying, “I am going to do some baking”, The next frame shows a shot of Paul sitting on the couch watching TV looking calm and happy. Next there is a shot of his mother getting the bowl and electric beater out of the cupboard and plugging it into the electric socket. The frame then switches back to Paul still sitting in the living room (open plan to the kitchen where the shots of his mother were taken) and he is still calm. His mother then puts the beater in the bowl and turns it on a low setting. The next frame if of Paul still sitting in the living room looking calm. Mother then turns

off the beater and there is a final shot of Mum praising Paul for remaining calm while she was used the beater. As Paul's fear was intense the sound of the beater was reduced by 75% at the editing stage.

Measures and Data Collection

The Fear Survey Schedule for Children-Revised (FSSC-R) (Ollendick, 2006) and The Questions About Behavioural Function (QABF) (Paclawskyj et al., 2000) measures were used during the initial interview to determine eligibility into the study.

The Fear Survey Schedule for Children-Revised (FSSC-R) (Ollendick, 2006) was used to determine eligibility for the study and assess the level of fear and number of fears the participants had. The FSSC-R is a self-report questionnaire that purports to measure the number of fears and the overall level of fearfulness in children. It is comprised of 80 items relating to fears on which children are required to rate their level of fear on a five-point scale ranging from 1 = none to 5 = very much. A three-point scale (*none, some, a lot*) has also been introduced to the measure for children younger than nine years of age.

The Questions About Behavioural Function (QABF) (Paclawskyj et al., 2000) was used in this study to define the function of the participants behaviour and to rule out any participants whose behaviour was not motivated by fear of the stimulus. The QABF is a measure designed for the functional assessment of behaviour problems in persons with developmental disabilities. Parents/caregivers rate each of the 25 items. The instrument produces five categories reflecting the behavioral functions of Attention, Escape, Physical, Tangible, and Nonsocial. Each question is scored along a four-point likert-type scale anchored with frequency descriptors of Never, Rarely, Some, and Often.

Data collection occurred over three phases these were baseline, post intervention phase one and post intervention phase two. Both The Behaviour Avoidance Test (BAT) (Lang & lazovik, 1963) and the visual analogue scale were completed at the three data collection phases.

The Behaviour Avoidance Test (BAT) (Lang & lazovik, 1963) was used to measure the avoidance of the feared stimulus at baseline and post intervention phases. The BAT was used to measure how close the child could get to their feared stimulus before they felt uncomfortable and stopped the measure. A fear hierarchy was developed for each participant and a point was scored for each step in the hierarchy the participant could complete. The Behavioural Avoidance Test provides a highly reliable behaviour measure and has scored high test re-test reliability ($r=.97$) (King, Muris, & Ollendick, 2005).

Alan had two fear hierarchies developed. The first was the proximity he could comfortably achieve with a dog on a lead and the second consisted of the same hierarchy but using a dog off the lead. His two hierarchies each consisted of eight steps and ranged from being 100 meters away from a dog to patting the dog next to him.

Alan's Fear Hierarchy

1. Dog 100m away on lead
 2. Dog 80m away on lead
 3. Dog 50m away on lead
 4. Dog 20m away on lead
 5. Dog 10m away on lead
 6. Measure how close the dog can get (m) on lead
 7. Dog standing beside Alan on lead
 8. Patting the dog on lead
-
1. Dog 100m away without lead
 2. Dog 80m away without lead
 3. 50m away without lead
 4. 20m away without lead

5. 10m away without lead
6. Measure how close the dog can get (m) without lead
7. Dog standing beside Alan without lead
8. Patting the dog without lead

Casey's fear hierarchy had eight steps that ranged from being in a room with a box of tissues to holding a tissue to her nose and touching her face with it.

Casey's Fear Hierarchy

1. Sitting in the room with a box of tissues
2. Sitting at a table with a box of tissues on the table
3. Sitting at the table with a tissue out of the box on the table
4. Closer to participant use full description of each step with complete sentences
5. Tissue on the table and touching participants hand
6. Participant holding tissue
7. Raising to face (not touching face)
8. Holding tissue up to nose (touching face).

Paul's fear hierarchy had 13 steps and included steps where he could tolerate his mother using the beater to the step where he approached the beater himself. The steps in Paul's fear hierarchy ranged from having the beater out in the kitchen while Paul was in lounge to Paul putting the beater in the bowl and pretending to mix a liquid. The complete fear hierarchies for each of the three participants are present below.

Paul's Fear Hierarchy

1. Have the beater out in the kitchen while Paul is in lounge
2. Have the beater plugged in the kitchen while Paul in the lounge
3. Mum put the beater in the bowl
4. Mum turn the beater on while in the bowl
5. Mum mixing a liquid beater turned off
6. Mum mixing a liquid with the beater turned on
7. Distance Paul can stand beside mum while she is using the beater
8. Paul stand beside mum while she uses the beater to mix milk and water
9. Have the beater on the table turned off
10. Distance Paul can stand beside beater
11. Touch it with it unplugged
12. Putting the beater in the bowl and pretend to mix
13. Putting the beater in the bowl and pretending to mix a liquid

A visual analogue scale was used to rate the participants feelings of fear/anxiety on a Likert scale from one to five (one = not scared at all, to five = extremely scared) (refer to appendix J) when thinking about each step in their hierarchy. This scale measured the participants' self-efficacy in relation to different situations and proximity to their feared stimulus.

Procedure

The following procedures were completed with each of the three participants. Once eligibility for the study was confirmed over the phone and consent forms signed and returned to the researcher, an interview with the participant and their parent/caregiver was organised at the Child and Family Psychology Clinic at the University of Canterbury.

Initial Interview. The initial interview was approximately 30 to 40 minutes long. Information was sought regarding the child's formal diagnosis of autism, their developmental history, antecedents to the child's fear/phobia, their fear responses and the consequences of their responses, and any strategies to overcome the fear/phobia that the family had previously tried. Refer to appendix K for a copy of the interview questions. At this interview the participants were requested to recall different examples of times in which they encountered their fear/phobia. What were the times which had caused them to respond with the most intensity and the times and places when their reactions were less intense. From this information, a fear hierarchy scale (Lang, Melamed & Hart, 1970) was negotiated and developed with each participant (and parent). The fear hierarchy scales are listed above. In this time the interview questions were asked and the parents completed the FSSC-R and QABF. It was during this interview that the participants reported each of their fears and selected the setting where the VSM was to be made.

Paul's initial interview was held at his home, as he was too anxious to attend the clinic. Present at this interview were Paul, Paul's mother and Paul's at home therapist/caregiver. The interview lasted approximately one hour during which the interview questions were asked and Paul's mother then completed the QABF. Paul's mother described the first incident when Paul developed this fear and subsequent times he encountered beaters. The setting was then decided for Paul's VSM and a time was arranged for the researcher to come back to the participant's home and complete the baseline measures and filming of the VSM.

Intervention Phase. Each participant was given their video to view at their home for a two-week period. A minimum of 6 viewing times was requested over this time. The parents received a diary to note the number of times and the days that the video is viewed (refer to appendix L for a copy of the diary).

Post intervention - Phase One and Two. The post-intervention phase was conducted at the end of the two-week intervention phase to measure the effect of the VSM intervention. Each participant and their mother met the researcher at their selected VSM setting. The participants were asked to complete the Behaviour Avoidance Test (BAT) (Lang and Lazovik, 1963) and the researcher recorded the number of steps in their fear hierarchy they felt they could comfortably undertake. If the participant felt anxious/uncomfortable they were able to stop the measure at any point. They were then requested to complete the visual analogue scale. Post intervention phase two occurred approximately 30 minutes later. The participants were asked to complete both the BAT and the self-efficacy measure once more and the researcher recorded their responses.

Dependent Measures & Data Analysis

The dependent measure was the number of steps completed in the participant's hierarchy and the number value the participant gave each step of the hierarchy for the self-efficacy measure. Changes in participants' performance on the BAT and self-efficacy measure were recorded at baseline, post intervention phase one and two and they were then compared to see if any change had occurred due to the independent variable, the VSM.

Performance across all three participants was additionally analysed to see the overall variability in the group and examine the effect of VSM as an intervention on each individual and as a group.

Chapter 3: Results

The findings for this study are presented separately for each participant. The results are shown in a table and then examined in detail. The results for the BAT measure are presented first followed by the self-efficacy measure. The BAT measure is presented in table format for each participant with a tick indicating the participant achieved that step in their hierarchy. The self-efficacy measure is also presented in table format. The results for Alan and Casey are shown in Tables 2 – 7. Baseline measures for Paul were obtained, but Paul was unable to complete the intervention as he was so fearful of the electric beater in his VSM and could not watch it. Due to his extreme fear response the intervention was not completed and post intervention measures were not pursued.

Alan's BAT Results

Table 2. *Alan's BAT With a Dog on a Lead*

Hierarchy Step	Baseline	P 1	P 2
1 70 m	✓	✓	✓
2 60 m	✓	✓	✓
3 50 m	✓	✓	✓
4 40 m	✓	✓	✓
5 30 m	✓	✓	✓
6 20 m	-	✓	✓
7 10 m	-	✓	✓
8 Standing beside	-	-	-
9 Patting the dog	-	-	-

Table 2 shows the results of the BAT measure for Alan at baseline and during the two post intervention phases while the dog had a lead on. At baseline Alan was able to complete five of nine steps of his hierarchy and stopped the measure when the dog, on a lead was 30m away from him. After the two-week intervention phase, Alan was able to complete seven of nine steps in his hierarchy and was able to have the dog on

a lead at 10m before stopping the measure. At baseline Alan was able to complete 55% of his hierarchy and this increased to 77% correct for both post intervention phases. Alan watched his VSM 10 times in the first week and nine times in the second week.

Table 3. *Alan's BAT With a Dog Not on a Lead*

Hierarchy Step		Baseline	P 1	P 2
1	70 m	✓	✓	✓
2	60 m	✓	✓	✓
3	50 m	✓	✓	✓
4	40 m	✓	✓	✓
5	30 m	-	✓	✓
6	20 m	-	✓	✓
7	10 m	-	✓	✓
8	Standing beside	-	-	-
9	Patting the dog	-	-	-

Table 3 shows Alan's results for the BAT measure at baseline and at the two post intervention phases while the dog was not on the lead. At baseline Alan was able to successfully complete four of nine steps of his fear hierarchy and stopped when the dog without a lead was 40m away from him. After the two-week intervention phase Alan was able to complete seven of nine steps in his hierarchy and was able to have the dog without a lead 10m away from him before stopping the measure. At baseline Alan was able to complete 44% of his hierarchy and this increased to 77% correct steps at both post intervention measures.

Alan Self-Efficacy Results

Table 4. *Alan Self-Efficacy Measure Using a Dog on a Lead*

Hierarchy Step		Baseline	P 1	P 2
1	70 m	1.5	1	1
2	60 m	2	1.5	1
3	50 m	2	2	1.5
4	40 m	3	2	2
5	30 m	4	2	2
6	20 m	5	3	2.5
7	10 m	5	4	4
8	Standing beside	5	4	4
9	Patting the dog	5	4	4

Table 4 above shows Alan's self-reported rating of fear at each step in his dog that was on a lead hierarchy. Alan reported he felt extremely scared (score of 5) when the dog was 20 meters away from him. After the two-week intervention phase Alan reported that he felt 'scared a little bit' to 'scared a little more' (from a score of 3 to 2.5) for this same distance during the post intervention phases. Alan also reported a 2-point decrease in fear for the measure at 30 meters away from the dog. This score went from very scared (score of 4) at baseline to a little bit scared (score of 2) post intervention. All of the distances measured showed a similar pattern of Alan reporting lower scores of his fear rating at each step in the hierarchy at post intervention 1 and 2.

Table 5. *Alan Self-Efficacy Measure When the Dog Was Not on a Lead*

Hierarchy Step		Baseline	P 1	P 2
1	70 m	2.5	2	2
2	60 m	3	2.5	2
3	50 m	3	3	3
4	40 m	4.25	3	3
5	30 m	5	4	4.5
6	20 m	5	5	5

7	10 m	5	5	5
8	Standing beside	5	5	5
9	Patting the dog	5	5	5

Table 5 shows the self-reported rating of fear for Alan for each step in his hierarchy when the dog was not on a lead. This table shows that there was a similar pattern in self-report as with the dog on a lead with a small decrease in fear levels after the two intervention phases. Reductions in the fear level reported went from ‘very scared’ (score of 4.24) at baseline for 30 meters away to ‘even more scared’ (score of 3) at post intervention. At the distance of 50 meters there was no change with Alan reporting that he felt a ‘little more scared’ (score of 3) at the baseline, and two post intervention measures.

Casey BAT Results

Table 6. *Casey BAT Measure With a Box of Tissues*

Hierarchy Step	Baseline	P 1	P 2	
1	Sitting in the room with a box of tissues on the table in the room	✓	✓	✓
2	Sitting at the table with a box of tissues on the table	✓	✓	✓
3	Sitting at the table with a tissue out of the box (pulled up)	✓	✓	✓
4	Tissue box closer to V (40cm)	✓	✓	✓
5	Tissue box closer to V (30cm)	-	✓	✓
6	Tissue box closer to V (20cm)	-	-	-
7	Participant touches the tissue box	-	-	-
8	Participant touches the tissue	-	-	-
9	Participant holds the tissue	-	-	-
10	Raising tissue to face	-	-	-
11	Touching tissue to the face	-	-	-

*P1/P2= post intervention phase 1 and 2

Table 6 shows the results for the BAT measure for Casey at baseline and the two post intervention phases. During baseline Casey was able to complete 4 of the 11 steps in her hierarchy before she felt uncomfortable and stopped the measure. In the two post intervention phases she was able to complete 5 out of 11 steps. Casey was able to have the tissue box 30cm closer after the VSM intervention. Casey watched her VSM nine times in the first week of the two-week intervention phase and did not watch it during the second week of intervention phase.

Casey's Self-Efficacy Results

Table 7. *Casey's Self-Efficacy Measure With a Box of Tissues*

Hierarchy Step	Baseline	P 1	P 2
1 Sitting in the room with a box of tissues on the table in the room	3	2	2
2 Sitting at the table with a box of tissues on the table	3	1	2
3 Sitting at the table with a tissue out of the box (pulled up)	4	3	3
4 Tissue box closer to V (40cm)	5	4	5
5 Tissue box closer to V (30cm)	5	5	5
6 Participant touches the tissue box	5	5	5
7 Participant touches the tissue	5	5	5
8 Participant holds the tissue	5	5	5
9 Raising tissue to face	5	5	5
10 Touching tissue to the face	5	5	5

*P1/P2= post intervention phase 1 and 2

Table 7 shows the results for the self-efficacy measure for Casey at baseline and the two post intervention phases. At baseline Casey reported that while sitting in the room with a box of tissues on the table in the room (step 1) she reported 'scared even more' (score of 3) at baseline, but after the intervention phase she had less fear and

reported that she felt ‘scared a little bit’ (score of 2). During baseline Casey reported that she felt a ‘extremely scared’ (score of 5) at the thought of the tissue box being 40cm away from her. At the first post intervention phase this had decreased to a ‘very scared’ (score of 4), but this returned to a ‘extremely scared’ (score of 5) and the second post intervention phase.

Paul’s Results. Paul was not able to complete the intervention phase as the video caused him too much anxiety and fear. At baseline Paul was unable to complete any of the hierarchy steps for the BAT measure and showed extreme fear and anxiety before leaving the room and ending the measure. He self-rated a score of 5 (extremely scared) for the self-efficacy scale across all of the hierarchy steps. .

On the first occasion of viewing the VSM, Paul’s mother talked to him about the video and she reported he seemed somewhat interested and watched the first 8 seconds. He stopped when he saw his mother getting the beater out of the cupboard. He then responded by yelling “no beater” and he locked himself in the bathroom. He mother attempted to show Paul the video without sound but this resulted in the same behaviour. His mother tried to skip forward to other parts of the VSM that just showed him relaxing in the lounge. This was done to increase his interest in watching the movie and provide an opportunity to give reinforcement (ice cream) for watching small sections of the VSM. Paul would still not engage and watch any of his VSM. After consulting with Paul’s mother and supervisors it was decided not to complete any post intervention measures as the VSM had caused the participant undue stress.

Chapter 4: Discussion

The prevalence of phobias is believed to be much higher among children with autism than with typically developing children (Mayes, et al. 2013). Children with ASD have been shown to have both a greater number of fears and a wider range of types of fear (Mayes et al., 2013). Treatment for fears and phobias such as Systematic Desensitisation and Cognitive Behaviour Therapy have been shown to be effective among typically developing children (Davis et al., 2011; King, Muris, Ollendick, et al., 2005). While there is evidence to support the use of these treatment approaches among typically developing children, there is still little evidence of the effectiveness of these interventions for other populations, including children with ASD. The purpose of this study was to investigate the effects of VSM as a treatment for fears and phobias in children with ASD and to investigate if VSM has an effect on the participant's self-efficacy.

Effectiveness of VSM as an intervention

The data from the BAT baseline and two post intervention phases indicate that there was some variability in the effectiveness of VSM as an intervention. Two of the three participants showed a small increase in steps at the post intervention BAT measure. Alan achieved three steps in his hierarchy, and Casey achieved two steps. The results from the self-efficacy measure followed a similar pattern. Alan self reported a small decrease in fear in both with and without a lead conditions. For Casey there was little change in her self-efficacy ratings with similar scores recorded at baseline, and during the two post intervention phases.

Alan. Alan showed the most change in both the BAT measure and the self-efficacy measure. At baseline Alan was able to complete five of nine steps of his hierarchy and ended the measure when the dog, on a lead was 30 meters away from

him. After the two-week intervention phase moved two steps and was able to be 10 meters away from the dog. The results from the condition of a dog not on a lead showed greater change. At baseline Alan was able to complete four of the nine hierarchy steps and stopped the measure at 40 meters away from him. At the two post intervention phases the number of hierarchy steps Alan could comfortably complete was increased to seven steps, when the dog was 10 meters away. He could not move to the next step, stand beside the dog, This step proved too large and could be improved by breaking down this step into smaller steps by decreasing the distance only one meter at a time. Alan's self-efficacy increased over the course of the study. He reported lower fear ratings for all of the nine hierarchy steps when the dog was on a lead. For the condition of the dog being off the lead there was still an increase in self-efficacy for most of his hierarchy steps but at 20 meters onwards there was no change in self-efficacy. Alan reported that the dog off the lead made him feel the most scared. Overall Alan increased the number of steps he could take in his fear hierarchy and reported lower fear ratings suggesting higher self-efficacy and that the VSM was a somewhat effective intervention for Alan. The Swney (2013) used VSM for three typically developing children who had a fear of dogs. The results of this study showed that two of the participant's made marked changes while the third showed some variability. The main difference between the Swney (2013) study and the present study was the introduction of the 'Dog Safety Book'. In the Swney study this was given to the participants at the same time as the VSM, whereas in the present study it was given after the post intervention measures. The present study was designed this way so the effects of the VSM by itself could be assessed. However, it may have been a combination of both the VSM and the 'Dog Safety Book' that account for the changes in the participants fear responses in the Swney (2013) study. An additional

post intervention measure after the Alan had received his book would have been a worthy addition to the current study.

Casey. Casey showed a slight change in her BAT measure during the two post intervention phases. At baseline Casey ended the BAT measure when the tissue box was 40cm away from her and at the two post intervention phases she ended the measure when the tissue box was 30cm away from her, an increase of one hierarchy step. Casey's showed a similar pattern with self-efficacy with only a slight increase. Casey reported lower fear ratings for the first three steps in her hierarchy with the most significant decrease for the step 'Sitting at a table with a box of tissues on the table'. Her fear rating went from 'scared even more' at baseline, to 'not scared at all' at the post intervention phase one. However, at the post intervention phase two the fear rating increased and was reported to as 'scared a little bit. For the higher items in Casey's hierarchy such as; touching the tissue box, touches a tissue, Casey's fear rating remained consistent at 'extremely scared' across baseline and the two post intervention phases. The length of the intervention may have limited Casey as she only watched her VSM nine times, whereas Alan watched his 19 times. A longer intervention period may have also allowed more time for Casey to respond to the VSM as some research has shown that participants vary greatly on how long it takes for them to respond to their VSM (Rosenberg et al., 2010). One of the participants in a study conducted by Rosenberg, Schwartz and Davis (2010) did not show immediate change whereas the other two participants responded immediately to the VSM. His performance stayed flat for four sessions while watching his video before any improvements were made, whereas the other two participants in the study made steady improvements from their first session onwards. In the present study it may have been beneficial to have probes and a longer intervention phase for those who

needed it. This does raise the question of how long do you implement the VSM intervention without improvement before adding another component to the intervention. This would be an important aspect to cover in future research.

Paul. At baseline Paul was unable to complete any of the hierarchy steps for the BAT measure and showed extreme fear and anxiety before leaving the room, therefore ending the intervention. Paul was not able to complete the intervention due to high levels of anxiety and fear when watching his VSM. Paul's mother, talked to him about the VSM and she reported he seemed somewhat interested, but the viewing distressed him. After discussion with the researcher, his mother attempted to show Paul the VSM with no sound, and tried to show him shorter sections such as shots of himself smiling. She also attempted to use a previous known reinforcer ice cream, to get him to view the VSM but to no avail. These findings suggest that VSM was not an appropriate form of intervention for Paul's level of fear response.

The current study showed variation of results between the participants. This has been identified in the literature with studies showing that for some children with ASD VSM is a very successful treatment yet not for others (Delano, 2007; Plavnick et al., 2014). Research indicates that individual factors may be somewhat accountable for the variation in the effect of VSM with children with ASD (Delano, 2007). Individual factors such as cognitive ability, motivation, and target behaviours have been indicated as some of the possible factors that impact the child's ability to learn from VSM and account for some of the variation in the literature (Delano, 2007; Plavnick et al., 2014). In the case of this study the individual factors that could have impacted on the effectiveness of the VSM could have been Alan's cognitive ability and his processing of his fear response, the function of Casey's behaviour and perhaps that she needed a longer period of time in the intervention phase to respond to the VSM

and the level of Paul's fear. These individual factors, and others, would have impacted on each child's ability to learn from VSM and account for some of the variation as seen in the literature.

Of the three participants, Alan showed the most progress. One possible explanation for this is that Alan was better able to understand his fear and analyse threat. For example, Alan stated that he was most afraid of people who could not control their dogs and who did not pay attention to rules such as the signs at the park saying dogs had to be on a lead. Alan could understand this risk and was always assessing this risk when filming his VSM. Sukhodolsky et al. (2008) reported that higher levels of anxiety were correlated with a higher IQ and that children with a higher IQ may better able to cognitively understand their fears and phobias. During the post intervention measures Alan reported that he felt a lot more comfortable around the dog he was exposed to, as he knew that the dog handler was in control at all times. Therefore, one must view his results with some caution, as he was cognitively able to discern that he was never in danger and that he did not need to feel anxious about the dog on or off the lead. Alan was able to assess his safety and think about his fear responses. He was able process why he was having this fear response and provide a logical response to it. This finding has not been reported in the literature looking at the treatment of fears and phobias in children with ASD but gives suggestion for further research into the used of both VSM and CBT in children with high functioning ASD.

Casey showed little change between her baseline and post intervention BAT and her self-efficacy measures, despite watching her video many times. One possible explanation may be the function of Casey's behavior. In retrospect, the function of Casey's fear behaviour may not have been avoidance but attention. When necessary

Casey could use tissues such as after defecating and when she urinated she did not use any form of tissue. Casey also received a lot of family attention for her fear so it would be of benefit when undertaking another study for a full functional assessment to be carried out before so the function of the fear can be understood before starting the intervention. This will ensure that the function of the behaviour is clearly established, and is not determined based solely upon parental report.

Paul's response to the baseline and VSM intervention was extreme. As soon as the electric beater was presented Paul screamed and had to remove himself by leaving the house. He checked many times to see when the researcher was leaving that she was taking the electric beater away with her and surprisingly could get close enough to open her bag to check it was in there. After this response the VSM storyline was edited. Previously it was thought that there would be close up shots of the electric beater mixing cream and the sound of the beater would start out quiet and gradually get louder. However, after Paul expressed such anxiety these shots were removed and the only exposure was a shot from the lounge looking into the kitchen where Paul's mother was getting the electric beater out of the cupboard and using it. This was shot from approximately six meters away from Paul. Despite the editing to the film Paul was still unable to watch the VSM. VSM was proposed as it was thought that it may be less aversive than in-vivo exposure, however for Paul, this type of treatment appeared to be equally aversive as exposure during the baseline BAT measure.

Overall is unclear whether VSM is an appropriate intervention for fears and phobias in children with ASD due to the variability between each participant. Whereas it seems the intervention may have been somewhat effective for Alan, VSM did not result in significant change for Casey and it was not an appropriate fit for Paul due to him being unable to complete the intervention. The literature indicates it is not

clear why VSM can result in such fast skill acquisition for some and yet for others there may not be change at all. There appears to be a number of contributing factors that may influence the effectiveness of VSM for children with ASD and the function of the behaviour appears to be one. Other factors such as cognitive ability, motivation, and the selected target behavior are indicated in the literature as some of the possible influences on the effectiveness of VSM with children with ASD (Delano, 2007; Plavnick et al., 2014). To answer these questions further research is needed that investigates the factors that influence children with ASD ability to successful learn from VSM.

Implications

VSM can be easily implemented, as the parent only needs to supervise that the child is attending to their video. With the use of technology ever increasing this form of intervention will become more accessible to parents, caregivers and teachers. Currently there are apps for creating social stories and apps for editing movies to use with smart phones and tablets enabling parents easily access to make and use this type of intervention.

The literature suggests that VSM a favourable form of intervention for children with ASD for several reasons (Charlop-Christy et al., 2000; Delano, 2007). Firstly, watching a video may help the child ignore irrelevant cues and help the child focus on the skills to learn. Secondly, watching the video demands no social interaction from the child (Charlop-Christy et al., 2000). Thirdly, this method presents information in a visual format which may be reinforcing to the child and keep them engaged in the task (Delano, 2007). Finally, VSM is thought to be effective with children with ASD as these children appear to have strengths in visual processing. A number of learning

strategies for children with ASD are based on visual cues, such as social stories (Delano, 2007).

Limitations and Future Research

There are a number of limitations to this study. Firstly, the number of participants is small. Difficulty with recruitment and time limits resulted in only three participants recruited. Due to the variation in the results and Paul not being able to complete the intervention, more participants were required to show the effectiveness, or not, of the VSM intervention. Secondly, this research could have been strengthened by completing a full functional assessment of all participants by the researcher and not from parent reports as used in this study. This would have identified the function of the fear/phobic response. Thirdly, having two or three probes during the intervention phase would have identified how each participant was tracking and would have improved the results for this study. This also could have given opportunity to include another phase to the study such as a social story to those participants not making progress. Fourthly, more time would have also allowed further editing of Paul's VSM to include less aversive shots of the beater and more reinforcing shots such as him smiling. Finally, more extensive follow up measures could have also strengthened this study. The post intervention phases were close together and this did not give a true representation of the long-term effects of the intervention. Another BAT measure one month post the completion of the intervention would have strengthened the results and shown any lasting effects of the VSM intervention.

Future Research

This small study points to the possibility of future research being undertaken. Given that the research indicates that VSM can result in rapid learning, research that

interprets the reasons for some of the variability could inform practitioners of when is it appropriate to use this form of intervention, how to use it and which groups would benefit most from VSM. Further research on children with ASD who respond well to VSM should also factor in the participant's cognitive ability and their level of fear; this would add to understanding individual characteristics and the variability in VSM interventions. Finally, future work might also consider the use of measures of psychophysiological arousal and a full functional behavior assessment so to avoid the problems associated with the validity of parent reports and the reliability of self-reports of children.

Conclusions

The aim of this study was to establish whether VSM was an effective approach in decreasing fear responses in three children with ASD. Due to the variation in the results and individual differences it was difficult to determine the effectiveness of this intervention for the different fears and phobias in the children with ASD in this small study. Alan showed the most progress of the three participants. Casey's baseline and post intervention measures were similar, and Paul was unable to complete the intervention due to his extreme fear response. In all, the results of this study reflect some of the literature, which suggest that while VSM can result in rapid learning, in some cases it may not work for all participants and individual differences can account for some of this variability (Delano, 2007; Plavnick et al., 2014). In this study some of the possible differences were the following; Alan's ability to think about his fear; and assess risk, the function of the behaviour being possible attention and not avoidance for Casey; and Paul's extreme fear response to the electric beater. Future research could examine the individual characteristics of children with ASD and the effectiveness or not of VSM.

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HUMAN ETHICS COMMITTEE

Secretary, Lynda Griffioen
Email: human-ethics@canterbury.ac.nz

Ref: HEC 2014/29

13 June 2014

Jordan Mulholland
School of Health Sciences
UNIVERSITY OF CANTERBURY

Dear Jordan

The Human Ethics Committee advises that your research proposal “An investigation into the effects of video self-modelling on the fear responses of children with Autism” has been considered and approved.

Please note that this approval is subject to the incorporation of the amendments you have provided in your emails of 28 May and 8 June 2014.

Best wishes for your project.

Yours sincerely



Lindsey MacDonald
Chair
University of Canterbury Human Ethics Committee

Appendix B

School of Health Sciences

Telephone: 027 712 0770

Email: jordan.mulholland@pg.canterbury.ac.nz



An invitation to participate in a study investigating the effects of video self-modeling on the fear responses of children with autism.

I am conducting research in this area as part of my Masters in Child and Family Psychology thesis. I am currently recruiting children to participate in my study.

To participate your child will have;

- A fear or phobia (e.g. fear of dogs, mechanical toys or objects...)
- A diagnosis of autism spectrum disorder or Asperger's
- The verbal ability to use 4-5 word utterances
- Aged between 5-15 years

If you and your child would like to know more about my study and/or would consider participating, please contact me. I appreciate your consideration of participation.

Thank you,

Jordan Mulholland

This study has received ethical approval from the UC Human Ethics Committee

Appendix C

School of Health Sciences

Telephone: 027 712 0770

Email: jordan.mulholland@pg.canterbury.ac.nz

The effects of Video Self-Modeling on the Fear Responses of Children with Autism.

Information sheet for Children

(for parents/caregivers to read with the child – as applicable)

Jordan is doing a project at her university and will work with you to help you with your fear of _____ (name of fear/phobia). You can choose if you want to part of this project or not.

Jordan will ask you some questions about how you feel about your fear. She will also talk to us to see what we think will help you to not be scared anymore. During this time, everything will just be the same, nothing will change.

With Jordan's help, you and Jordan will make a video where you get to be the star! You will get to watch this video at home for two weeks.

Later on, after you have watched your video, you will go back to where you made your movie and there will be the/a _____ (name of fear/phobia) in real life, but don't worry you will be safe and with your parents and Jordan the whole time.

During the project you will have a secret code name. The only people who will know your real name will be Jordan and her two teachers Gaye Tyler-Merrick and Laurie McLay. All the information about you will be kept safe and locked in a filing cabinet in Jordan's office and then it will be destroyed when Jordan has finished writing about the project.

If you don't want to continue being in the study all you have to do is tell me (Jordan) or your parents and it will be OK.

If you have any questions about the project you can talk to Jordan or her university teacher Gaye Tyler-Merrick.

Thank you

Jordan Mulholland

Supervisors:

Gaye Tyler-Merrick

Dr. Laurie McLay

Phone: 03 364 2987 #44380

Phone: 03 364 2987 #7176

Email: gaye.tyler-merrick@canterbury.ac.nz
laurie.mclay@canterbury.ac.nz

Email:

This study has received ethical approval from the UC Human Ethics Committee

Appendix D

School of Health Sciences

Telephone: 027 712 0770

Email: jordan.mulholland@pg.canterbury.ac.nz

What are the Effects of Video Self-Modeling on the Fear Responses of Children with Autism?

Information sheet for Parents/Caregivers

My name is Jordan Mulholland; I am a student at the University of Canterbury in the Child and Family Psychology programme. I am currently completing my thesis for my Masters Degree. I am interested to see if using video self-modeling is an effective treatment for children with autism who have fears or phobias. Video self-modeling is the use of images of one's self engaging in a desired behaviour. Through observing one's self the person can learn skills or adjust to environments.

I am inviting you and your child to participate in my study. This will involve a 2-step consent process. The first step will involve talking to you about your child's diagnosis of autism, their fear/phobia and how their fear impacts on your family and their life. If your child is included in the study I will invite you and your child to meet with me to develop a fear hierarchy scale. This is a list of steps that contain the feared stimulus. The steps are arranged from the least feared at the bottom to the most feared at the top.

You will also be asked to complete the Questions about Behavioural Function for your child. This questionnaire is designed to measure the function of the fear and consists of 25 questions, this will take 10 minutes to complete.

Your child will complete the Behaviour Approach Test which consists of increasing difficult steps where the individual approaches the feared stimulus, your child can stop the measures at anytime. After the test they complete the subjective units of distress scale using a likert scale from 0=none to 8=very much.

At a chosen location discussed with you and your child we will film the video for your child. Day 1 of filming will involve teaching your child some self-talk and deep breathing. After this your child will be filmed using these techniques to remain calm while pretending to be in the same environment as the _____ (Note that _____ will not be present during this filming). Day 2 will involve me filming the _____ in the same location with out you and your child present. I will then edit these two to create a film of your child remaining calm while appearing to be in the same location as the _____.

I will then give this video to you and your child to take home and watch it for a period of two weeks (minimum of 6 viewing times). I will also supply you with a diary sheet to record the dates and times the video is viewed.

After this we will come back to the filming location and you child will complete the Behaviour Approach Test again and we will talk about their fear.

Participation in this study is voluntary, and you and your child have the right to withdraw from the study without further penalties. The final date for withdrawing from the study is 01/11/2014. If you do decide to take part in the study but decide to withdraw before the cut off date, I will do my best to remove any information relating to you and your child.

For anonymity your child will be given a code name throughout the study to protect their identity. Any information about your child and the data I collect will be securely stored in a locked filing cabinet in my office at the College of Education. Access to this information is limited to me and my two supervisors Gaye Tyler-Merrick and Laurie McLay.

All data will be securely stored in password protected facilities and locked storage at the university of Canterbury for five years following the study. Then it will be destroyed. Any published report and academic conferences will use code names to protect the identity and anonymity of both you and your child. However, with your permission I would like to be able to show the videos made for the intervention at academic conferences.

A report of the study will be available to you once the study is complete in early 2015. The thesis will also be available on the University of Canterbury website via the UC library database, please note again that no real names will be included in the final copy.

This study has been reviewed and has gained approval by the University of Canterbury Human Ethics Committee. However, if you have any complaints about the study you may contact my supervisor or the Chair, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

If you have any questions about the study, please feel free to contact me or my Senior Supervisor, Gaye Tyler-Merrick.

Yours sincerely,

Jordan Mulholland

Supervisors:

Gaye Tyler-Merrick

Dr. Laurie McLay

Phone: 03 364 2987

Phone: 03 364 2987

Email: gaye.tyler-merrick@canterbury.ac.nz

Email: laurie.mclay@canterbury.ac.nz

Appendix E

Telephone: 027 712 0770

Email: jordan.mulholland@pg.canterbury.ac.nz

**The effects of Video Self-Modeling on the Fear Responses of Children with
Autism**

Parent/Caregiver Eligibility Consent Form

- I understand that information provided at this stage will be used to determine my child's eligibility for inclusion in this research study
- I have been provided with a full explanation of this study and have been given an opportunity to ask questions.
- I understand what will be required of my child for them to take part in this study.
- I understand that participation in this study is voluntary, and that my child or I can choose to withdraw at any stage without penalty.
- I understand that any information or opinions my child provides will be kept confidential to the researcher, and that any published or reported results will not identify my child or me.
- I understand that all data collected for this study will be kept in locked and secure facilities at the University of Canterbury, and will be destroyed after five years. And that any published report and academic conferences will not use the real names of my child and me.
- I understand that if I require further information regarding this research I can contact Jordan Mulholland. I can also contact Jordan's supervisor (Gaye Tyler-Merrick) or the Chair of the University of Canterbury Educational Research Human Ethics Committee if I have any complaints or concerns.
- By signing below, I agree to my child participating in this research study should my child meet eligibility criteria.

Name: _____

Date: _____

Signature: _____

Email address: _____

Appendix F

Telephone: 027 712 0770

Email: jordan.mulholland@pg.canterbury.ac.nz

**The effects of Video Self-Modeling on the Fear Responses of Children with
Autism**

Child Consent Form

- I have been told about Jordan's project and I have been allowed to ask questions.
- I know that if I take part in this project I will get some help with my fear of this will involve me being around _____ (name of fear) but I will be with my parents and Jordan at all times so I will be safe.
- I know that I can change my mind at any time about being in this study and no one will mind.
- I know that my parents and I will have code names so no one will know our real names.
- I know that Jordan will only tell her teachers Gaye Tyler-Merrick and Laurie McLay who I am. Jordan might tell other people about the project but no one will know it was me who took part, because Jordan won't use my real name.
- Any information collected about me will be stored in a locked cabinet at Jordan's workplace and will be destroyed after five years.
- I am happy to be in the video and also let Jordan show my video to other people when she is doing a presentation.
- My Mum or Dad will receive a written report of Jordan's findings early in 2015.
- I know that if I have any questions I can ask Jordan or my parents.

Child's name: _____

Signed: _____

Date: _____

Note: The child's parents will also receive an information sheet and will be required to complete their own consent form in addition to their child for the study to proceed.

Appendix G

Telephone: 027 712 0770

Email: jordan.mulholland@pg.canterbury.ac.nz

The effects of Video Self-Modeling on the Fear Responses of Children with Autism

Parent/Caregiver Consent Form

- I have been provided with a full explanation of this study and have been given an opportunity to ask questions.
- I understand what will be required of my child for them to take part in this study.
- I understand that participation in this study is voluntary, and that my child or I can choose to withdraw at any stage without penalty.
- I understand that any information or opinions my child provides will be kept confidential to the researcher, and that any published or reported results will not identify my child or me.
- I allow Jordan to show the video made for the intervention at academic conferences.
- I understand that all data collected for this study will be kept in locked and secure facilities at the University of Canterbury, and will be destroyed after five years. And that any published report and academic conferences will not use the real names of my child and me.
- I understand that I will receive a report of the findings in early 2015 if I so choose. I have provided my email address below for this purpose.
- I understand that if I require further information regarding this research I can contact Jordan Mulholland. I can also contact Jordan's supervisor (Gaye Tyler-Merrick) or the Chair of the University of Canterbury Educational Research Human Ethics Committee if I have any complaints or concerns.
- By signing below, I agree to my child participating in this research study.

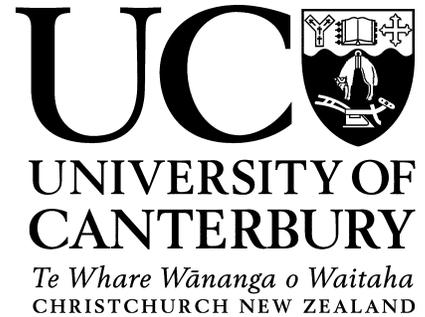
Name: _____

Date: _____

Signature: _____

Email address: _____

DOES YOUR CHILD HAVE A FEAR OR PHOBIA?



My name is Jordan; I am a student at the University of Canterbury in the Child and Family Psychology programme. I am currently completing my thesis for my Masters Degree. I am interested to see if using video self-modelling is an effective treatment for children with ASD who have fears or phobias.

If you are interested in my study or would consider participating and you child has;

- A fear or phobia (e.g. fear of dogs, mechanical toys or objects...)
- A diagnosis of Autism or Asperger's
- The verbal ability to use 4-5 word utterances
- And is aged 5-15 years

Then please contact me. I appreciate your consideration of participation.

Thank you,

Jordan Mulholland

Telephone: 027 712 0770, Email: jordan.mulholland@pg.canterbury.ac.nz

Appendix I

Initial Contact Screening Questions

How old is your child?

Is your child able to attend to a 2-4 minute video?

Does your child have the verbal ability to use 4-5 word remarks

Are you able to take your child to a meeting at the Dovedale centre and to their filming location 3 times?

Questions about the child's ASD diagnosis, for parents

When was your child diagnosed?

What is your child's diagnosis?

Who diagnosed your child?

What tools were used for the diagnosis?

Does your child have any secondary diagnoses?

Is your child currently on any medication?

Questions about the fear for parent or child where applicable

Can you please tell me what it is that you/your child is afraid of?

How long has your child been afraid of...?

How does your child react to the...?

Has there ever been a time where your child has not reacted to a...?

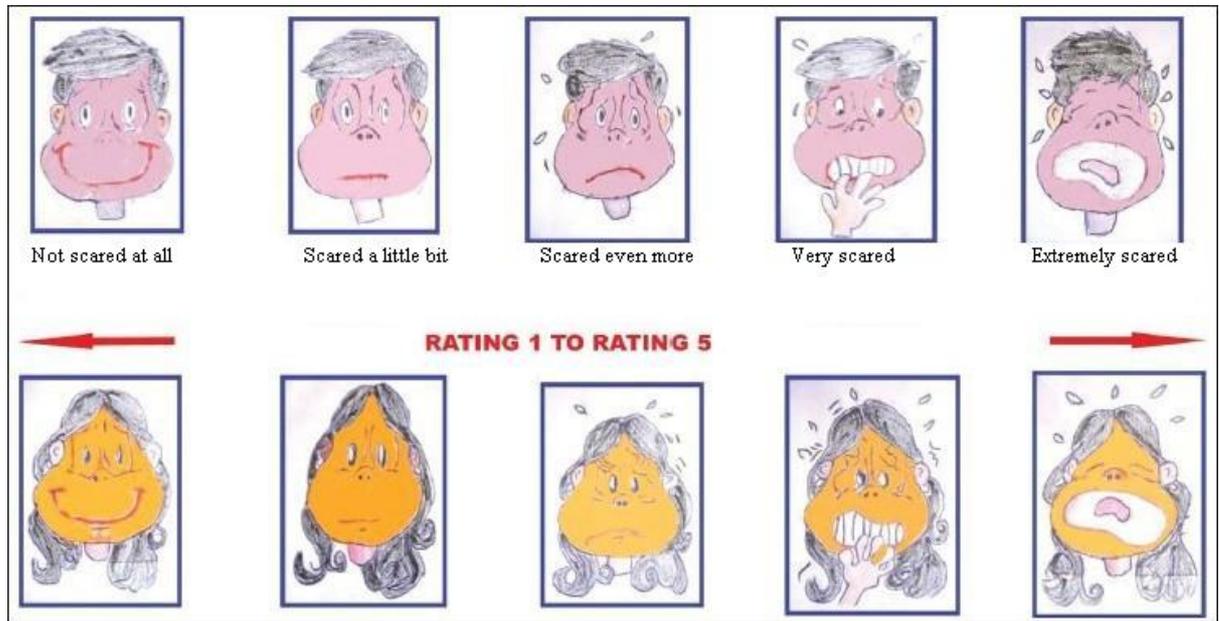
Does this fear response occur only with certain people?

Is there always some level of fear response expressed when your child encounters a...?

Are any other service or support providers currently involved in providing intervention for your child's fear?

Appendix J

Visual Analogue Scale (Sweny, 2013).



Appendix K

Structured Interview Questions (First Interview)

How does the fear impact on family life?

Have you tried any therapies for this fear already? If so, what did you try and what were the results?

Describe the last time your child encountered a...? How did your child respond?

What happens before/after the child is presented with or sights the feared stimulus?

Where does your child encounter the...?

How intense is your child's fear response?

How long does it last?

When and where does this occur? Where does it occur most frequently?

What happens after or to stop the behaviour?/ what do you do when it occurs?

What goals do you have for your child and their ability to cope with...?

Appendix L

Video Diary

Please note the days, times and numbers of viewing the video (minimum of six times over the two week period).

Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14

Notes:

Date	Comments