Using Video Modelling and Video Self-Modelling to Teach a Group of Young Adults with

Intellectual Disabilities to Make Point of Sales Electronic Transactions

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Kate Danna

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Supervisors:

Mr. Lawrence Walker, College of Education

Associate Professor Karyn France, Department of Child and Family Psychology

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Abbreviations

APM: Automatic Payment Machine

ASD: Autism Spectrum Disorder

CBT: Cognitive Behavioural Therapy

DS: Down syndrome

DV: Dependent Variable

FF: Feed Forward

ID: Intellectual Disability

IV: Independent Variable

PDD-NOS: Pervasive Developmental Disorder – Not Otherwise Specified

PIN: Personal Identification Number

PSR: Positive Self-Review

SS: Social Story

VM: Video Modelling

VSM: Video Self-Modelling

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Abstract

The ability to make purchases in community settings is highly advantageous as it allows individuals freedom of choice and the ability to function within their own community. Independence and autonomy is especially important for individuals with intellectual disabilities (ID's), however prerequisite knowledge of money concepts required for making cash purchases may be too complex for individuals with cognitive challenges. The use of EFTPOS cards to make purchases is a comparatively easy process with limited prerequisite skills required therefore, is an ideal starting point for teaching purchasing skills to individuals with cognitive challenges. Video modelling (VM) and video self-modelling (VSM) procedures have shown to be effective and efficient instructional techniques for teaching various skills to individuals with ID's however, research on the effectiveness and efficiency of these procedures with individuals with Down syndrome (DS) or with EFTPOS purchases is minimal.

This study aimed to examine the effectiveness of VM and VSM interventions in teaching independent EFTPOS purchasing skills to 6 young adults with DS using a non-concurrent within-participant design. The results indicates that both VM and VSM interventions were effective and efficient as all 6 participants exhibited increases in task acquisition with the introduction of the intervention, and 5 of the 6 were able to consistently use their EFTPOS cards to purchase chosen items throughout intervention and follow-up generalisation probes (2 weeks post-intervention). Therefore, this study suggests both VM and VSM may be equally effective for teaching young adults with DS EFTPOS purchasing skills in community stores.

CHAPTER 1: Introduction

In westernised societies as children develop into adults, independence, autonomy, and freedom-of-choice is acquired naturally and is commonly encouraged. However, for individuals diagnosed with intellectual disabilities (ID's), such as Down syndrome (DS), acquiring independence and basic life skills is typically more difficult due to impaired cognitive functioning (Wheeler, Ford, Nietupski, Loomis, & Brown, 1980). Despite such difficulties a plethora of research highlights the importance of teaching individuals diagnosed with ID functional life skills to enhance their independence and help facilitate life in the community (Cannella-Malone, Fleming, Chung, Wheeler, Basbagill, & Singh, 2011; Mechling, Gast, & Langone, 2002; Possi, 1994).

Inclusion is defined as a process of increasing the participation of individuals in the community, making the effort to meet the diverse needs of all individuals, regardless of their background, beliefs, abilities or disabilities, and culture. The ability to function independently within the community increases when individuals have purchasing skills. However, many individuals with disabilities become increasingly sheltered and protected by those around them including their parents, in comparison to typically developing children for whom independence is taught and expected. Wheeler et al. (1980) observed that whilst most adolescents develop skills necessary for grocery shopping without educational intervention adolescents with ID's, need to be taught functional living skills, such as money handling skills, directly (Possi, 1994).

Research indicates making purchases is one of the most important skills to enable living an independent life in one's community and to ensure individuals can access many items in many settings such as grocery or department stores, restaurants, or movie theatres (Possi, 1994; Colyer & Collins, 1996; Snell, 2000). However, the

skill sets required to accurately and independently make cash purchases in the community may be beyond the skill level of the individuals. For example, when completing a cash purchase an individual is required to have prerequisite skills in their repertoire such as the knowledge of addition, more than and less than, subtraction, money values, change, and many more concepts including reading social cues of others (Mechling, Gast, & Barthold, 2003). Therefore, the complexity of the task hinders an individual's ability to acquire the skills and presents an issue as to how to teach the individuals the skill sets as the time taken to acquire the necessary skills can be quite long and sequential (Mechling et al., 2002). Therefore, as Browder and Grasso (1999) indicate, new options are needed to teach individuals with ID's how to independently make purchases.

These days in New Zealand, Australia and many other parts of the world the use of electronic payment cards such as Debit or Electronic Funds Transfer Point of Sale (EFTPOS) cards are commonly used rather than cash as a more convenient and efficient way of making purchases. Using an EFTPOS card to make purchases may be a beneficial tool for individuals diagnosed with ID's as many of the prerequisite skills required for cash purchases are not required for EFTPOS transactions. No identified studies have attempted to teach individuals with DS to independently use an EFTPOS card to make purchases in community settings, and only one identified study attempted to teach individuals with ID's to do so (Mechling et al., 2003). The most effective and efficient instructional technique for teaching individuals with DS how to make EFTPOS purchases in the community accurately and independently is not known.

Research suggests observational learning techniques such as video modelling (VM) and video self-modelling (VSM) can be effective instructional strategies for

teaching individuals with ID a variety of social and functional skills which can be maintained and generalised across different persons and settings (Burton, Anderson, Prater, & Dyches, 2013). Furthermore, Harper, Harper, Williams, Rydon, & New Zealand Down syndrome Association (2004) emphasise the importance of using visual aids to support the learning of individuals diagnosed with DS as they are commonly visual learners therefore are more likely to learn by observing others than by listening to instructions. Additionally, Tingey (1988) encourages using teaching techniques that enable learners to generalise their learnt skills in other settings. However, as no studies have used VM or VSM to teach individuals with DS to use EFTPOS cards in community settings to make purchases, it is not known if either VM or VSM are effective for this purpose and if so which is more effective and efficient, resulting in retention of learnt skills, and leading to generalisation of skills. This study aimed to investigate the effect of VM and VSM on teaching young adults with DS to independently make EFTPOS purchases in community supermarkets.

CHAPTER 2: Literature Review

The following literature review examines the research under the following headings: Down syndrome; Down syndrome and Social Skills; Down syndrome Learning and Mathematics; Modelling and Observational Learning; Rapid Behaviour Change; Video-based Instruction; VM; Video Self-Modelling; Comaring VM and Video Self-Modelling; Social Stories; and Current Study.

Down Syndrome

Research indicates that although acquiring independence with age is as much a prospect for persons with Down syndrome (DS) as it is for all young persons, the process of becoming indepdent is not as naturally acquired for those with DS due to cognitive and motor development delays (Van Gameren-Oosterom, Fekkes, Reijneveld, Oudesluys-Murphy, Verkerk, Van Wouwe, & Buitendijk, 2013). DS is a condition caused by an extra copy of chromosome 21, labelled *Down syndrome* after Langdon Down, the doctor who was the first person to write about the features of the syndrome in 1866 (Harper et al., 2004; Fussell & Reynolds, 2011).

There are three types of DS; Mosaic, translocation, and trisomy 21, all of which involve chromosomal abnormalities and involve three copies of chromosome 21 which results in the typical characteristics (mental deficiencies and physical appearances) of DS (Harper, Harper, Williams, Rydon, and New Zealand Down Syndrome Association, 2004; Tingey, 1988). Mosaic DS is potentially the result of errors during cell division which lead to some cells having 46 chromosomes and others having 47 chromosomes (Tingey, 1988). Mosaic DS accounts for approximately 1% of individuals, is not inherited, and results in fewer learning and medical problems in comparison to

translocation and trisomy 21 (Harper et al., 2004; Tingey, 1988). Research indicates that approximately 4-5% of individuals with DS have translocation, which can be inhereted and occurs when an individual has 46 chromosomes however one in each pair (typically chromosome 14, 21, or 22) is long as it has another chromosome attached (Harper et al., 2004; Tingey, 1988). In contrast, the most prevalent type of DS is trisomy 21, this type can not be inherited (Harper et al., 2004). Individuals with trisomy 21 have a total of 27 chromosomes due to three copies of chromosome 21 (Harper et al., 2004).

Although individuals with DS are more similar to family members then other individuals with DS, physical phenotypes individuals with DS share means the syndrome is readily- and easily-recognisable (Tingey, 1988). Common phentotypical features of DS include; "hypotonia, a small brachycephalic head, epicanthal folds, up-slanting palpebral fissures, brushfield spots in the iris, a flat nasal bridge, a small mouth, small ears, excess skin at the nape of the neck, single traverse palmar creases, short incurving fifth fingers, and a widened 'sandal gap' between the first and second toes" (Fussell & Reynolds, 2011, p.177). Tingey (1988) emphasises that some individuals with DS may display the majority of these features however others may only display a few. Additionally, Tingey (1988) reported that with increasing age some common characteristics associated with DS become more apparent. Hartley (1986) reported that in general, children with DS typically have a weaker muscle grip, less overall muscle tone, demonstrate tasks slower and have less balance than non-disabled children.

Research indicates that although there is a broad range of cognitive and behavioural outcomes associated with individuals diagnosed with DS, most have delays in learning and development, and an intellectual disability in the mild-to-severe range (Fussell & Reynolds, 2011; Harper et al., 2004; Burns & Gunn, 1993). Fussel & Reynolds (2011) indicate that DS is the most common genetic cause of intellectual

disability as it occurs in as many as 1 in 600-1000 births. Specifically, research indicates

that individuals with DS typically lack the ability to handle more advanced cognitive

processes such as attending to several variables at one time, comprehending instructions,

planning alternative approaches to a problem or expressing oneself effectly to receive

help from others (Moessinger, Mills, Harley, Ramakrishnan, Berendes, & Blanc, 1986;

Hartley, 1986). Furthermore, Hartley (1986) concluded that storage and retrieval of

auditory information and storage of visual information was a severe deficit for children

with DS.

Individuals with DS commonly experience co-morbidities and multiple medical

difficulties such as issues related to their, vision (refractive errors 50%, cataracts (15%)),

hearing (Otitis media 50-70%), growth, orthopaedic problems, seizures, poor immunity,

constipation, skin, sleep apnoea (50-75%), atlanto-axial instability and other comorbid

conditions such as coeliac disease, leukaemia (1%), congenial heart defects (50%),

thyroid disease (15%), gastrointestinal atresia (12%), autism spectrum disorders (5-10%)

and increased risk of Alzheimer's disease and depression as they age (Fussel & Reynolds,

2011; Harper et al., 2004; Tingey, 1988).

Down Syndrome & Social Skills

Social skills can be defined as learned behaviours that enable an individual to

interact positively with other people (Avcioglu, 2013). Generally, social skills are learned

unsystematically and unconsciously through observing and taking part in interactions

with peers and family. However, for some individuals such as those with DS, this method

of acquiring social skills is inadequate. Therefore some individuals with DS have poor

social skills and thus difficulty interacting with others (Avcioglu, 2013). Van Gameren-

Oosteron et al., (2013) state that "90% of adolescents with DS experience significant

problems in social functioning" (p.4599/p.4605) and have a limited ability to perform complex tasks required for effective social functioing. Specifically, Van Gameren-Oosteron et al., (2013) found that 29% of the adolescent participants with DS made little eye contact, "68% 'lived in a world of his/her own'", the majority had difficulty processing information, 75% had trouble understanding conversations, 33% were frequently disobedient, and 50% experienced difficulty with change and/or adapting to new/unfamiliar environments (for example, resisted change, panicked easily, and/or remained passive in novel environments/situations). Although skill acquisition varies greatly between individuals with DS, in general they typically require intensive and targetted programs which focus on facilitating the ability to develop positive relationships, respond effectively to requests and expectations, and to communicate their needs and wishes to others (Van Dujin et al., 2010, Soresi & Nota, 2000, Van Gameren-Oosteron et al., 2013). Van Gameren-Oosteron et al., (2013) suggest that any specific functional/social skill acquired by an individual with DS is likely to profoundly influence his/her and their families daily life in a positive way.

Down Syndrome, Learning & Mathematics

Research highlights the ability of individuals with DS to learn and acquire skills. Burns and Gunn (1993) recommend that skills taught to individuals with ID's be "useful, desirable, practical…acquired in a social context and in the physical context in which it will be ultimately requested" (p.17). Burns and Gunn (1993) further identified the enhancement of an individual's sense of competence and peer modelling as potential motivating factors of learning new skills.

Individuals with DS commonly have sensory (visual, auditory) difficulties that can contribute to learning delays in both language and numeracy (Tien, 1999; Hammond &

Millis, 1996). Research indicates that in general the numerical abilities of individuals with DS are more impaired than their literacy skills, two years behind approximately (Horstmeier, 2004). Faragher and Clarke (2014) additionally indicate that individuals with DS appear to have difficulty learning mathematics however, when explicitly taught and provided with the right support young people with DS can acquire basic number competence. Faragher and Brown (2005) reported that when taught in the context in which the skill is to be required individuals with DS successfully learned numeracy skills, therefore indicating that individuals with DS have the ability to learn numeracy skills when taught with effective techniques. Studies have shown young people with DS have the capacity to learn money skills such as money identification (including identifying item costs), tendering money, and calculating change (Faragher & Clarke, 2014; Bochner, Outhred, Pieterse, & Bashash, 2002). As Faragher and Clarke (2014) further emphasise, it is possible to go through life without such mathematics skills however this is equated with a loss of independence and quality of life. Although the use of money is immensely practical and contributes to independence and quality of life, the concept of money is complex. Faragher and Clarke (2014) highlight the deep complexities involved in learning money skills for example, money can be difficult to handle (due to size and commonly experienced fine-motor difficulties of individuals with DS); the size of money does not correspond with its value; counting/adding money involves adding or counting the value of the money (not the number of notes or coins); and money varies from country to country. Furthermore, the demands of financial literacy and money skills change as time and technologies progress. For example, in New Zealand and other westernized countries electronic finance is increasingly popular therefore there is less motivation to learn physical money skills and more of a demand to learn to independently use and comprehend electronic transactions (Faragher & Clarke, 2014).

Current literature on teaching money skills to individuals with ID's supports four basic adaptations for paying for items (Browder & Grasso, 1999). The first is when a pre-specified amount of money is given to the individual (Matson, 1981; Schleien, Certo, & Muccino, 1984; Storey, Bates, & Hanson, 1984; McDonnell, 1987; Alcantara, 1994; Bates, Cuvo, Miner, & Korabek, 2001). However, this technique does not improve the independence and autonomy of individuals with DS as another person is required to assist the individual in making the transaction by giving them the pre-specified amount of money. Therefore, the individual also has limited freedom of choice as they are only able to purchase items that match that monetary value. Additionally, these studies all taught individuals how to make purchases under the monetary value of $10, therefore further limiting the generalizability of the skill as typical activities and foods/drinks young people enjoy today are likely to cost more than $10.

Another common method used is when coins or notes are matched to picture prompt cards indicating the amount needed for the purchase (Sprague & Horner, 1984; Gardill & Browder, 1995). Although this method has been shown to be effective, it is also limiting as individuals are only taught to make cash purchases under the total value of $5, therefore they would not be able to purchase multiple products or generalise their skills to other places throughout the community such as to going bowling or meeting friends at a café.

Additionally, the use of a calculator or number line to add prices has also been shown to be effective with students with ID's (Wheeler et al., 1980; Nietupski, Welch, & Wacker, 1983; Matson & Long, 1986; Wilson, Cuvo, & Davis 1986; Frederick-Dugan, Test, & Varn, 1991; Sandknop, Scheuster, Wolery, & Cross, 1992). However, this method requires the individuals to carry with them a calculator or number line everywhere they intend to make purchases, potentially increasing the amount of time

taken to complete a transaction. Furthermore, using a calculator or numberline may not be user-friendly in busy supermarkets or when the individual does not have a calculator or number line with them. Therefore this technique is not ideally inclusive unless the technique was very discrete.

The next dollar strategy, in which the cashier is given the amount of dollars which equal the total cost rounded up to the next dollar, is a common and effective strategy for teaching individuals with ID's how to make cash transactions (McDonnell, Horner, & Williams, 1984; McDonnell, 1987; McDonnell & Ferguson, 1989; Test, Howell, Burkhart, & Beroth, 1993; Denny & Test, 1995). However, pre-requisite addition and other complex money comprehension skills are required to be able to competently practice this strategy.

The majority of studies summarised were effective and used rigorous single-case designs to assess the participants purchasing abilities. However, the general limitations of these techniques include that they require a limited purchasing amount (generally under $15-$20) and provide limited independence as other individuals are required to assist the individual. Additionally, these methods do not teach the students how to complete electronic transactions, as they focus on cash money.

A study conducted by Shafer, Inge, and Hill (1986) addressed the use of automated teller machines (ATM) by students with DS. The study used a multiple probe across behaviours design using a replica ATM in the students' homes. Generalisation probes were conducted at community bank machines, before, during, and after instructions and indicated the students generalized the learned banking skill. These results were maintained for up to 6 months. However, cheques were used rather than debit or EFTPOS cards in this study, therefore limiting its generalizability as cheques are not as widely accepted throughout New Zealand in general as EFTPOS or Debit cards today.

A study conducted by McDonnell and Ferguson (1988) instructed individuals with disabilities to make withdrawals from an ATM. McDonnell and Ferguson (1988) focused specifically on the individual being able to independently insert his or her bank card, enter their four-digit PIN number, and press the correct buttons to withdraw specific amounts of money. The intervention was conducted in community settings and resulted in the individuals being able to successfully withdraw money from an ATM independently. Follow-up probes at four- and eight-weeks also indicated that the intervention was effective in maintaining the skill.

The use of an EFTPOS (or debit) card is an alternative means to make purchases for individuals who may be unable to count money (or have the required skills to competently complete cash purchases). Additionally, electronic transactions do not require limits on the total monetary amount an individual can spend (other than by limitations in place by their personal financial situation, parents, pay, or other reasons). Although, the use of EFTPOS (or debit) cards appears feasible, only one other study identified (Mechling, Gast, & Barthold, 2003) addressed this method of purchasing for students with ID's. Mechling et al. (2003) assessed money skills as taught by a multimedia program focusing on computer-based VM, video prompting, and still photographs and the generalisability to community and novel stores. The participants were three individuals, between the age of 16 and 18, with moderate ID's (IQ scores ranged between 35 and 54). Instructional sessions were conducted through simulations with the multimedia program, twice daily 5 days per week, in an individual room at the students high school. This investigation supported the findings of Alcantara (1994), Norman, Collins, & Schuster (2001), and Mechling, Gast, & Langone (2002), who found video recordings to be a viable means to simulate community environments when instruction cannot occur solely through community-based instruction.

The results indicated the study was effective in teaching the participants acquisition and generalisation of using a debit card on an Automatic Payment Machine (in novel stores the participants overall percentage of correct responses to stimuli increased from 7.4% to 92.6%). This study also appeared relatively efficient as one participant met criterion after 9 sessions; however the other two participants met criterion after 18, and 20 sessions. Limitations of this study include that all participants had the same PIN number; "1,2,3,4". This raises security and ethical issues as the researcher was aware of the participants personal PIN numbers and any persons who attained a participant's debit card could easily guess the PIN number and would therefore have access to the funds available. This also removes a level of autonomy from the participants as rather than choosing their own PIN number, they were provided with one. The study also focused on the precise act of using an Automatic Payment Machine not the whole process involved in making a purchase (as each trial began with the instructor taking the participant to the check-out line, handing the participant their debit card, and presenting the task direction – 'use the debit card to buy the (name of item to be purchased), then the instructor waited 3 seconds for the students response (i.e. interacting with the cashier).

The majority of research on functional maths skills with participants with ID's required prerequisite maths and money skills such as counting skills, addition, money recognition and differentiation, and being able to correctly use calculators (Colyer & Collins, 1996; Frederick-Dugan et al., 1991; Gaule, Nietupski, & Certo, 1985; Matson & Long, 1986; Sandknop et al., 1992; Browder & Grasso, 1999). However, for some individuals with ID's, such prerequisite skills may not be attainable therefore the interventions may not be applicable. Additionally, the majority of studies conducted their interventions in educational settings such as classrooms, and/or community settings. Only a limited number of studies taught all desired skills in community settings. Maintenance

and generalisation probes of most of the studies were positive and in most cases maintained levels above baseline.

Whilst there is some literature on the acquisition and generalisation of money skills in young adults with ID's, there is very little which focuses precisely on individuals with DS and no identified studies which focus on young adults with DS completing electronic funds transactions. However, the literature identifies that young people with ID's have the ability to learn how to make monetary transactions. This identifies a significant gap in the literature leading to the question of how to best support the learning of money skills in regards to making electronic transactions, in young adults with DS.

Modelling & Observational Learning

As Bandura's social learning theory emphasises, a large portion of human behaviour occurs within social contexts by observing and interacting with others (Bandura, 1969; Bandura, 1977). Additionally, Harper et al. (2004) state that individuals with DS are typically visual learners therefore observational learning techniques should be applied. Research also suggests that learning by passively observing others may be more effective in comparison to interactive modeling tecniques (Biederman, Stepaniuk, Davey, Raven, & Ahn, 1999). The four established necessary and sufficient conditions for learning by observation to occur are (1) the observer's attention to the demonstrated behaviour/skill (2) retention in memory (3) reproduction of the behaviour from memory when a similar occasion presents itself and (4) motivation to exhbit the observed behaviour/skill (Bandura, 1977; Dowrick, 2012). Research conducted by Grant & Evans (1994) has demonstrated that modelling can produce rapid gains in learning, as learning can occur from only one observation of a model thus, allowing individuals to demonstrate the newly learnt skills without error.

Video-Based Instruction

Research emphasises the importance of teaching individuals with disabilities functional and social skills to enhance independence and community-based living. Although instruction is recommended to occur within a community environment the logistics of such instruction is an issue. As Wissick (1999) indicate getting the individual to the community environment frequently enough for behaviour change to occur is a problem due to schedules and travel. However, video-based instruction can represent realistic real-life situations where the desired skill or behaviour is to be performed (Biederman et al., 1999; Wissick, 1999). Over recent years, video-based instruction has become increasingly more efficient for teaching individuals with ID's functional and social skills as researchers emphasise the benefit of focusing instruction on the salient features of a task/skill (Ayres & Langone, 2008). Researchers highlight the benefit of generalisation of learned skills/behaviours with video-based instruction as common physical and social stimuli (real-life images/video, real-life conversation) can be included and natural contingencies can be utilized (i.e., exchanging money for a desired item) which enhances the likelihood of generalisation occurring (Langone, Clees, Reiber, & Mtazbo, 2003; Ayres & Langone, 2008). Biederman et al. (1999) emphasises the benefits of video-based instruction for individuals with ID's as the visual information can be slowed down or paused to allow the individual enough time to adequately process the observational information.

Video Modelling

Video modelling (VM) is a commonly used technique which involves an individual viewing video footage of a model engaging in targeted behaviours/skills with the aim being the individual later performing the targeted behaviour/skill (Burton, 2013; Cihak, 2010; Dowrick, 1991). The video recording of the model allows for realistic replications of the individual's environment (Mechling et al., 2003). Allen, Wallace, Renes, Bowen, & Burke (2010) emphasise that in comparison to live modelling, VM produces significantly more rapid behaviour change and substancial generalisation. Furthermore, research has indicated that for skill acquisition, no additional reinforcement or prompting is required however, the individual must attend to the model (Charlop-Christy, Le, Freeman, 2000; Cihak & Schrader, 2008; MacDonald, Sacramone, Mansfield, Wiltz, & Ahearn, 2009). VM has been effectively used within a variety of disciplines (i.e. medicine, sports, and behavioural research), and with a variety of ages, cultures, and targeted behaviours. (Nikopoulos & Keenan, 2007; Dowrick, 1999). Smith, Hand, & Dowrick (2014) indicate that VM can be advantageous to learners with disabilities as extraneous information which may disrupt learning can be eliminated and the most salient information/behaviours can be highlighted. Current developments in video technology mean that video production is an inexpensive and easily accessible intervention option. Individuals can view videos as many times as they like as devices with digital recording technology (phones, tablets, still and video cameras) are now ubiquitous.

A literature search was conducted with the search terms video modelling OR video modelling AND down syndrome OR intellectual disabilit* OR developmental disabilit* OR mental retardation AND social skill* AND functional skill*. The search engines utilised were ERIC, Education Research Complete, Google Scholar,

PsycARTICLES, PsycINFO, and Psychology and Behavioural Sciences Collection.

Studies which used VM as the sole intervention (without other intervention modalities

such as reinforcement or prompting) were included in the review to assess the

independent effects of VM on teaching individuals with ID's social and/or functional

behaviours/skills. However, a study by Haring, Kennedy, Adams, & Pitts-Conway (1987)

which used discrete one-on-one teaching followed by VM was included due to the

similarity between their methodolgy and this study. In addition a study conducted by

Biederman et al., (1999) was included as the participants in their study included three

children with Down syndrome. Studies which used point of view modelling and

continuous video modelling exclusively were excluded from the literature review as this

technique was not utilised in the current study. Table 1 depicts the studies which fitted

the above inclusion criteria.

Table 1

Studies using Video Modelling to teach people with intellectual disabilities functional &/or social skills

Author & Year	Participants	Dependent Variable	Target Behaviours/Skills	Intervention Results	Maintenance Results	Generalisation Results
Allen,Wallace, Renes, Bowen, & Burke, 2010 (VM)	Four men (16 – 25 years) ASD	15-second partial interview recording of 8 interactive behaviours	Functional - Wearing a WalkAround mascot to entertain customers in a retail setting	Mixed	Mixed 1 month post-intervention	N/A
Avcioglu, 2013 (VM)	Four students (10 – 11 years) ID	Learning level of the target students to greet people they are familiar with	Social – Greeting people	Positive	Positive 1, 3 & 4 weeks post-intervention	Positive Different people & different environments
Axe & Evans, 2012 (VM)	Three 5 year olds boys PDD-NOS	Frequency of correct responses to 8 facial expressions	Social – Responding to 8 facial expressions	Positive	N/A	N/A
Biederman, Stepaniuk, Davey, Raven, & Ahn, 1999 (VM)	Six children, three with DS diagnoese & three with ASD	Number of presentations or duration of the video presentation	Functional – Basic dressing skills	Mixed	N/A	N/A
Haring, Kennedy, Adams, Pitts-Conway, 1987 (discrete one-on-one teaching & VM)	Two men and one woman (20 years) ASD & developmental delay diagnoes	Percentage of correct social responses during purchasing task	Functional - Generalisation of shopping skills across community stores	Positive	Positive 1 & 2 weeks post-intervention	N/A
Kellems, & Morningstar,	Four men (20 - 22 years) ASD	Percentage of independent steps	Functional - Individual job related tasks	Positive	Positive Up to 30 days post-	N/A

2012 (VM)	diagnoes	completed correctly for each task			intervention	
MacDonald, Sacramone, Mansfield, Wiltz, & Ahearn, 2009 (VM)	Two boys (7 and 5 years) ASD , typically developing girl and boy (both 5 years)	Percentage of intervals of cooperative play and duration (number of seconds) of reciprocal verbal interaction chains	Social – Reciprocal pretend play with typically developing peers	Positive	Positive 1 month post-intervention	N/A
Nikopoulos & Keenan, 2003 (VM)	6 males, one female (9-15 years) ASD	Latency to social initiation & time spent in appropriate play	Social – Social intiations	Mixed	Mixed 1 month post-intervention	Mixed Across settings, peers, & toys
Nikopoulos & Keenan, 2004 (VM)	Three boys (between 9 and 12 years) ASD	Latenct to social initiation and total duration of reciprocal play	Social – Social intiations and duration of reciprocal play	Positive	Positive 1 & 3 months post-interventon	N/A
Nikopoulos & Keenan, 2007 (VM)	Three boys (6.5 – 7 years) ASD	Latency to social initiation & imitative response, & time engaged in reciprocal play	Social – Acquiring complex social sequences	Positive	Positive 1 & 2 months post-intervention	Positive Across peers

Social Skills

VM has been utilised by various researchers to teach students with ASD appropriate social skills. Avcioglu (2013) utilised a multiple probe between participants design to assess the effect of VM to teach four 10-11 year old students with ID's attending a special education school to greet people. In the study the students were taught how to approach and greet people by watching a VM of peers exhibiting the desired behaviours. Researchers collected the percentage of correct behaviours by the participants, which included being aware of the familiar person when they encountered each other, approach the familiar person when they encounter each other, to look at the persons face, greet the person verbally, and wait for the persons response to the greeting. All four participants met criterion (100%) during the intervention phase and maintained these scores during the generalisation phase (with different students in a different class) four days after the intervention phase had ceased. Thus, Avcioglu (2013) demonstrated that VM was effective in teaching the students with ID's to greet people.

Axe and Evans (2012) used a multiple probe across behaviours design to examine the effectiveness of VM to teach three 5 year old children with PDD-NOS how to respond to 8 different facial expressions: Approval, bored, calming, disapproval, disgusted, impatient, pain, and pleased. Axe and Evans (2012) presented the participants with two VM videos, one with solely the experimenter acting-out each one of the 8 facial expressions, and the other with one experiementer acting-out each one of the 8 facial expressions and the other researcher modelling an appropriate response. Participants were scored on the frequency of correct responses to each of the facial expressions. A response was considered correct if it matched or was similar to the response modelled by the second experiementer in the VM videos. During the baseline phase the participants responded correctly to 0, 3, and 2 facial expressions out of 8, respectively. During

the intervention phase two participants correctly responded to all 8 facial expressions and maintained these scores. The third participant's correct responses to the facial expressions were inconsistent. During the maintenance (4 and 8 months post-intervention) probes the participants correctly responded to 8, 6, and 3 out of the 8 facial expressions respectively. Therefore, Axe and Evans (2012) successfully used VM to rapidly increase the frequency of correct responses to facial expressions of three children with PDD-NOS.

MacDonald et al. (2009) employed a multiple probe across three play sets design with two boys (5 and 7 years, respectively) diagnosed with ASD and their typically developing peers, one girl and one boy (both 5 years). During viewing sessions, the participants viewed VM's of two adults acting out a sequence of pretend play twice then were told, "It's time to play" and were given four minutes to play with set toys. Viewing sessions continued until the participant had 'mastered' the cooperative play. Through visual analysis and interpretation MacDonald et al. (2009) reported that the VM was sucessul and rapid at extending both pairs of participant's sequences of reciprocal pretend play together across the three different play sets (airport, zoo, and grill games). Furthermore, MacDonald et al. (2009) reported the participant's learned behaviours were maintained over a period of 1 month post-intervention.

Nikopoulos and Keenan (2003) used a multiple-treatment design with seven children (9-15 years) diagnosed with ASD and other comorbidities to assess the effects of VM to promote social initiations and play behaviours. During the intervention phase the participants were required to individually view one of three 35 second VM's of a typically developing peer and the researcher participating in social initiating play behaviours with one toy. One participant was also given a VSM to view and another participant also participated in an additional condition, Extended Appropriate Play. Additionally, general praise or a small piece of food was given to the participant if they engaged with the experimenter during the intervention phase. Visual analysis and interpretation indicated that no participants met criterion during baseline (emitted a

social initiation within 25 seconds) however of the seven participants, four participants met criterion mostly when the one toy shown in the VM was present and rarely met criterion when a combination of toys were present. These results were maintained at the 1 month follow-up and generalised across settings, peers, and toys.

Nikopoulos and Keenan (2004) employed a multiple baseline across participants design to examine the effects of VM to teach three boys (7 – 9 years) with ASD social initiation skills and to increase the duration of their reciprocal play with peers. Each participant was required to view a 35 second VM of a peer and initiating a social interaction and engaging in reciprocal play with the experimenter then was taken into a room with the experimenter and toys. An additional intervention phase was added where the VM video was simplified to only show the model initiating a social interaction with the experimenter, it was during this condition that the participants exhbited the most significant, rapid and consistent behaviour changes. All participants demonstrated enhanced social initiation and reciprocal play skills which were maintained at the 1 and 3 month follow-up phase.

Nikopoulos and Keenan (2007) utilised a multiple baseline across participants design to invesitgate the effectiveness of VM to teach three boys (6.5-7 years old) diagnosed with ASD complex social sequences. Nikopoulos and Keenan (2007) additionally utilised an A-B design to teach a 7.5 year old girl with ASD complex social sequences with VM. Each participant was given four (20-37 second) VM's of a peer initiating a social interaction with the researcher. The dependent variables were social initiations, reciprocal play, imitative responses, object engagements, and other behaviours. These behaviours were mesasured during a 5 minute period with a 10 second partial interval recording system in the experimental room with the experimenter after the participant had viewed their VM. The results indicated that all four participants successfully built a sequence of social behaviours, displayed relatviely rapid

behaviour change (between 9 and 24 sessions), and the behaviours of all participants were maintained at 1- and 2-month follow-ups and displayed adequate generalisation across peers.

Functional Skills

The importance of having functional skills for individuals with disabilities is emphasised throughout the literature for various reasons including as a way of integrating individuals into community life, enhancing their quality of life and providing individuals with a sense of both community and autonomy (Allen et al., 2010). Allen et al., 2010 used a multiple-baseline across participants design to evaluate the effectiveness of VM to teach a vocational task to four young men with ASD. In the study, the men were taught how to perform tasks (such as waving, and shaking hands) whilst wearing a mascot costume to engage customers in a retail store by watching two VM (one scripted 1.5 minutes and one naturalistic 4.5 minutes in length). All participants met criterion which was to perform at minimum 30% which was considered to be "life-like" and "engaging" during the intervention phase. However only one participant consistently met criterion. At the one-month follow-up two participants performances were above criterion, the two other participant's performance did not met criterion.

Biederman et al. (1999) employed a between-participants and within-participants design to examine the effect of timing parameters in VM to teach six children (6-10 years), three with DS and three with ASD basic dressing skills. For half of the participants the number of repetitions for each task VM was held constant and the presentation speed of the VM varied. For the other half of participants the number of repetitions for each task VM was varied and the presentation speed of the VM was held constant. Each participant was exposed to two VM video's with different rates of speed for the within-participants aspect of the study. Biederman et al. (1999) results indicated that slower presentation speeds of skills led to significantly better results than VM videos presented with faster speeds. Therefore, Biederman et al. (1999)

emphasised the importance of allowing children with developmental delays, such as those with DS , enough time to process the relevant information.

Kellems and Morningstar (2012) utilised a multiple probe across behaviours design to assess the effects of VM to teach vocational skills to four young adults with ASD. Individualised vocational tasks were selected for each participant after collaborative meetings with the participants, their parents, employers, teachers, and job coaches. The participant's job coaches, coworkers, and peers were used in the VM's. Each particpant received three VM's to teach three tasks related to their individual vocational duties (for example, cleaning the sidewalk, cleaning the bathroom, or polishing wood). On average participant's skill acquisition increased from 25.66% in baseline to 88.91% in intervention and 91.56% in maintenance.

Haring et al. (1987) employed a multiple baseline across participants design to evaluate the effectiveness of VM to teach generalisation of shopping skills to three young adults with ASD. Haring et al (1987) first taught the participants the required shopping skills one-on-one then introduced VM to teach generalizaion of their shopping skills. The results of the study indicated that VM used in conjunction with discrete one-on-one teaching of cash money purchasing skills was effective in teaching the participants to purchase items and generalise their skills across settings thus, increasing their independent functioning. The results also show that VM was effective in rapidly increasing the social responses made by all three participants during interaction with other people whilst shopping. However, as the VM was used in conjunction with other intervention methods, no conclusions can be drawn as to what resulted in the participants learning the shopping and generalisation of shopping skills.

In summary all ten studies identified during the literature search utilised single case research designs and found VM to be a viable, effective and efficient method for teaching people of varying ages with varying levels of intellectual impairments (ASD, ID, PDD-NOS, DS, and other developmental delays) various social and functional tasks. These studies reported

successful maintenance of the learned skills from between 4 days to 8 months, in addition to Avciouglu (2013), Nikopoulos and Keenan (2003), and Nikopoulos and Keenan (2007) reported successful generalisation of the participants newly acquired behaviours across: people and environments; settings, peers, and toys; and peers, respectively. However, the research indicates that not all participants displayed consistent improvements in skill acquisition during either intervention and/or maintenance phases (Axe & Evans, 2012., Allen et al., 2010). In contrast, no conclusive outcomes can be drawn as to the specific effectiveness of VM in the study conducted by Haring et al. (1987) as VM was utilised in conjunction with one-on-one teaching of the desired skill. However, Haring et al. (1987) demonstrated that VM was an effective method for teaching young adults with ASD to generalise their previous learnings, through one-on-one teaching of shopping skills. The majority of research found was specific to individuals diagnosed with ASD, no studies identified were designed specifically for a DS population. However, Biederman et al., (1999) reported the success of VM with individuals with DS and emphasised the importance of slower presentation speeds to allow for sufficient time to process the visual information. Overall, the number of sessions before criteria were met in each study ranged from 1.53 to 6 sessions, indicating VM resulted in rapid changes in performance. Previous research suggests VM as an exclusive intervention modality can be a rapid and effective means of teaching social and functional skills, which may be generalised to persons with intellectual impairements such as those diagnosed with ASD.

Video Self-Modelling

In contrast to VM, video *self*-modelling (VSM) is an observational learning procedure which involves filming an individual and editing the footage to show only positive depictions of the individual accurately and independently performing the targeted behaviour or skill (Burton et al, 2013; Dowrick, 1991; Hitchcock, Dowrick, & Prater, 2003). Dowrick (2012) indicated the

importance of ensuring the desired behaviour or skill to be obtained through VSM is within the individual's zone of proximal development, meaning that the behaviour or skill is achievable, but just out of reach. Cihak and Schrader (2008) suggested that VSM may have been originally used to increase the similarity of observer characteristics and maximise attention given to the model as the individual acts as their own model, however Dowrick (2012a) reports that this theoretical justification of the importance of model similarity and of oneself being the most similar model is misleading and thus, proposed self model theory. A full explanation can be found in the *Feed Forward* section.

Research supports the use of VSM in various applications for learning and changing desired behaviour such as, depression, class disruption, anxiety, aggression, selective mutism, social skills, walking, swimming, reading, writing, increased job productivity, and many more (Dowrick, 1991; Smith et al., 2014). VSM procedures have been systematically evaluated with individuals of all ages and with various populations including individuals with and without disabilities (Dowrick, 1991). As Dowrick (1991) suggests, no specific population seems to be unable to profit from self modelling, although certain populations may experience higher gains.

Literature suggests that the general impact of the model is enhanced in VSM as the individual is his or her own model. Bandura's (1997) belief that similarity of the model (age, gender, ethnicity) has played a huge part of learning from VM. This concept is reinforced by research indicating that the similarity and attractiveness of the model is an important variable in determining the likelihood of imitation (Bandura, 1977; Dowrick, 2012). Bandura (1997) noted the advantage of seeing oneself perform accurately as providing clear information on how to best perform the targeted behaviour or skill and strengthening beliefs in one's capabilities. A contrasting view that other research hasn't been able to substantiate is that of, Kehle, Bray, Margiano, Theodore, & Zhou (2002) who speculate that when an individual views their positive and effacicous VSM the individual's memory of the past maladaptive behaviour/skill may be

replaced by exemplary ones. However, this contrary view does not seem to be supported by the literature. Dowrick (2012a) has further contributed to explanatory theories of VM/VSM interventions, suggesting that when individuals observe skills/behaviours of others we may use "mental time travel" (MTT) to work out how to attempt the desired skill. Dowrick (2012a) emphasises that only sometimes does observing another individual's behaviours result in replication as the observer must already have the component skills which make up the desired skill within their behavioural repertoire.

It is suggested that VSM is associated with 3 primary benefits for the individual: Firstly, it provides a competent performance for the person to learn from. Secondly, VSM shows the individual that they are able to perform the targeted behaviour/task. And lastly, it boosts the individual's motivation, self-belief, and self-efficacy. (Dowrick 2012; Dowrick, Kim-Rupnow, & Power, 2006; Bandura, 1997).

Positive Self-Review

Positive self-review (PSR) is a form of VSM that is used when the student is able to perform the targeted behaviour or task however not at the desired level or frequency (Collier-Meek, Fallon, Johnson, Sanetti, Delcampo, 2011; Dowrick, 1999; Dowrick, 2012; Prater, Carter, Hitchcock, Dowrick, 2012). The video is edited to show the student performing at this targeted level. PSR can be useful for rarely exhibited or newly learned skills as these can be too rare to receive much in the way of reinforcement (i.e. a child with ASD exhibiting appropriate social behaviours) (Prater et al., 2012). Therefore, when captured on video, the student can observe the behaviour or skill frequently and thus it may become established and consistent (Hitchcock et al., 2003).

Feed Forward

In contrast to PSR, feedforward (FF) involves targeting behaviours or skills the individual *has not previously attained* however the component behaviours necessary to perform the target behaviour are already a part of the individual's repertoire (Dowrick, 2012a; Hitchcock et al., 2003; Smith et al., 2014). Dowrick (1991) emphasises that FF provides both skills information and strengthens self-belief and self-efficacy, a major mediating influence in generalizing and maintaining the behaviour change. Self-modelling videos are created by editing together component parts of the required behaviour or skills that are manageable for the individual to show them appearing to perform the target skill/behaviour competently (Hitchcock et al., 2003). For social and daily living skills, video feedforward can be achieved with planning and scripting as a movie director would do, then each scene is filmed and the final footage is edited. Alternatively, the target behaviour/skill can be placed in the desired context cinematically (Smith et al., 2014). Dowrick (2012a) emphasises the "remarkably rapid" (p. 217) behaviour changes and performance improvements often resulting from FF VSM interventions as the individual viewing their FF VSM may use MTT mechanisms such as mirror neurons to help envisage themselves later performing the desired task. As Dowrick describes, MTT is the human ability to remember past events and anticipate and plan future events (Dowrick, 2012a). Similarly, Dowrick (2012a) states that when an individual observes another's behaviour, mirror neurons enable the individual to perceive the intentions of others and imitate their behaviour/s.

Dowrick's (2012a) self model theory also emphaises the importance of the component behaviours of the desired skill already being part of the behavioural repertoire of the individual as an essential element in evoking rapid behaviour change. Dowrick (1999; 2012) indicates that FF has been shown to result in more rapid behaviour change in comparison to feedback as component skills/behaviours within an individual's capabilties are reconfigured and create what appear to be new skills.

Rapid Behaviour Change

Accumulating research with observational learning and VM, particularly FF VSM, emphasises the "ultra-rapid behaviour change" (Dowrick, 2012, p. 30) frequently observed indiscriminately in participants. Dowrick (2012, 2012a) highlights the human ability to experience "almost instantaneous" (2012a, p. 216) behaviour change by mentally picturing future events made-up of component skills already within an individual's behavioural abilities, otherwise known as FF VSM.

Dowrick (2012, 2012a) indicates that although video-modelling interventions which produce rapid behavioural changes are commonly brief (2 - 12 minutes over a period of weeks), it is important to focus on the significant changes in performance occurring almost instantly as a result of the modeling intervention. Comparatively, typical therapies also considered to be brief (i.e., 1 hour session - 6 six weeks of sessions) frequently result in mild to moderate changes in performance (Dowrick, 2012). For example, research in the area reports occasions where participants who had previously been attending various types of therapies (i.e., cognitive behavioural therapy, occupational therapy, physical therapy, physiotherapy) for months to years with no to minimal progress, attempted VSM and within remarkable amounts of time (i.e., 12 min (2 min video viewed 6 times), 10 min (1 min video viewed 10 times), 3 min (3 min video viewed once)) experienced significant behavioural changes which commonly generalized across situations (Coulson, Adams, O'Dwyer, & Croxson, 2006; Dowrick, 1976; Dowrick, 2012; Dowrick & Raeburn, 1995; Kehle, Owen, & Cressy, 1990). Dowrick (2012a) highlighted that for all individuals who experience success with VM/VSM when they had not been successful with other treatments; the most crucial element is the individual seeing themselves achieve success in their future. Smith et al. (2014) additionally reiterate that VSM has been shown to produce rapid behavioural changes

with participants of varying ages, sexes, abilities, and disabilities who previously experienced no change with other common intervention modalities.

Due to the extremely rapid behaviour changes resulting from significantly brief interventions some researchers have questioned current theories which attempt to explain such effects (Dowrick, 1999). Dowrick (2012a) suggests such rapid changes may be due to intense changes in an individual's self-efficacy, however the limited number of studies examining this potential explanation failed to report such conclusions. Dowrick (2012a) suggested the relevance of MTT and mirror neurons with extremely fast changes in behaviour associated with VSM. Although many brain areas associated with MTT have been investigated, observational learning and future performances with which mirror neurons may be related have not been investigated (Dowrick, 2012a). Furthermore, Dowrick (2012a) posits that MTT will only influence an individual's future behaviour when self-modeling conditions are met, for example the component behaviours of the desired skill being established within the individuals behavioural repertoire.

The concepts of MTT and mirror neurons are present in Dowrick's (2012a) proposed self model theory for learning from the future as governed by the three propositions of the theory: (1) "observational learning takes place on the basis of a simulated self model constructed from component behaviours based on one's own current skills...all modeling (observational learning) is self-modeling" (p. 221), (2) "performance of behaviour, in anticipated (challenging) situations, is based on the activation of a self model from a hierarchical set of neurological simulations. Thus, self-modeling is the guiding mechanism for current and future behaviour" (p. 221), (3) "learning is most rapid when it is achieved with feed forward" (p. 221). Therefore, Dowrick's (2012a) self model theory indicates that all observational learning is internally encoded and thus can be performed in the future when

necessary, as long as the component behaviours of the future performance are already in the individual's behavioural repertoire.

A literature search was conducted with the search terms video self-modelling OR video self-modelling AND Down syndrome OR intellectual disabilit* OR developmental disabilit* OR mental retardation AND social skill* AND functional skill*. The search engines utilised were ERIC, Education Research Complete, Google Scholar, PsycARTICLES, PsycINFO, and Psychology and Behavioural Sciences Collection. Studies which used VSM as the sole intervention (without other intervention modalities such as reinforcement or prompting) were included in the review to assess the independent effects of VSM on teaching individuals with ID's target behaviours/skills. Studies which used point of view modelling and continuous VM exclusively were excluded from the literature review as this technique was not utilised in the current study. Table 2 depicts the studies which fitted the above inclusion criteria.

Table 2

Studies using Video Self-Modelling to teach people with intellectual disabilities functional &/or social skills

Author & Year	Participants	Dependent Variable	Target Behaviours/Skills	Intervention Results	Maintenance Results	Generalisation Results
Bellini, Akullian, & Hopf, 2007	Two boys (4 – 5 years) ASD	Unprompted social engagement with peers	Social – Social engagement with peers	Positive	Positive Immediately post-intervention	N/A
Buggey, 2012	Three 3-year-olds with ASD	Number of physical and vocal social initiations with peers during play time	Social - Social initiations during play	Negative	Negative	N/A
Buggey, Hoomes, Sherberger, Williams, 2011	Four children (3-4 years) ASD	Number of physical and vocal social initiations with peers in the playground at recess	Social - Social initiations during play	Mixed	Mixed Immediately post-intervention	N/A
Burton, Anderson, Prater, & Dyches, 2013	Three adolescent (13 – 15 years) males ASD & a 13 year old male ID	Percentage of steps participants completed correctly	Functional - Estimating the amount of money to pay for a given item and the amount to receive in change	Positive	Mixed Immediately post-intervention	N/A
Ohtake, Takeuchi, & Watanabe. 2014	Two males ASD , one in first grade and one in second grade	Level of performance of putting the buttocks in the pants during urination	Social – Eliminating public undressing during urination	Mixed	Mixed Immediately post-intervention	N/A
Pierce, 2013	Four participants (2 males, 2 females 19	Number of pauses per minute, Number of	Social – Pausing, eye contact,	Mixed	N/A	Mixed Across therapists

– 22 years) with
ASD

breaks in eye contact
per minute, and
latency to first
response

& social initiations

Social Skills

Bellini et al. (2007) investigated the effectiveness of VSM on increasing the social engagement of two pre-school boys (4 and 5 years) diagnosed with ASD with a multiple baseline design across participants. Each participant received three VSM videos (approximately 2 minutes in length) of their unprompted social engagement with their peers during play time. The participant's three VSM videos were alternated so one was viewed each day for 17 school days across 4 weeks. After each viewing of their VSM participants were requested to have "free-play". Bellini et al. (2007) reported that the VSM intervention was successful in increasing unprompted social engagement periods of both participants with their peers from 3% to 43% and 6% to 24%. Additionally, Bellini et al. (2007) reported the participant's exhibited rapid behaviour change that was maintained after the VSM had been withdrawn. However, the small sample size of this study poses a significant threat to validity.

Buggey (2012) utilised a single-case multiple baseline design across participants to assess the effectiveness of VSM to facilitate social initiations with three 3-year-old children diagnosed with ASD. The participants each viewed their 2-3minute long VSM of themselves initiating social interactions with peers during play, on their arrival to school in the mornings for 8 sessions. Buggey (2012) identified no significant changes in behaviour for any of the three participants and noted the relationship between age and efficacy of VSM may have contributed to this result as "early skills in initiating social interactions" (p. 109) may have been necessary for the VSM to be effective.

Buggey et al. (2011) used a single-case multiple baseline design across four participants (3-4 years-old) diagnosed with ASD to assess the effectiveness of 2-3 min VSM videos depicting the participant initiating social interactions and socially interacting with peers, to increase their social initiations with peers during play. The participants viewed their VSM on arrival at school for eight consecutive days. Buggey et al. (2011) reported that two of the four participants

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exhibited significant improvements in social initiations during play. One participant exhibited potential treatment effects. However, the youngest participant exhibited no change in behaviour. Buggey et al. (2011) indicate that the participants age and therefore limited cognitive ability, social maturity and other potential variables may have contributed to his results.

Ohtake et al. (2014) conducted a multiple-probe across participants design in order to evaluate the effectiveness of VSM on eliminating public undressing during urination of two boys (first grade and second grade age) diagnosed with ASD. Participants were required to view their VSM's two or three times per week for three weeks for one participant and for two weeks for the other. The researcher filmed the participants during urination twice per week for twelve weeks and used discrete categorization to analyse the any changes in the participant's performance on a scale from 0 to 2 with 0 being the participant pulling their pants down to their ankles and 2 being the participant not showing their buttocks. Ohtake et al. (2014) reported the VSM lead to a rapid decrease in exposing body parts during urination for both participants however, additional intervention (VSM with a superhero in the video) was required for one of the participants to eliminate him from exposing his buttocks. Therefore the VSM only successfully contributed to full elimination of undressing for one of the two participants. Additionally, whilst the participants viewed their VSM's their teacher praised their on-camera behaviour by stating, "you are doing so well". This may have lead the participants to pay extra attention to the behaviours demonstrated in the video and may have reinforced the importance of their behaviours in comparison to the participants watching their VSM's with no praise thus, potentially influencing their self-efficacy and motivation to perform those behaviours in future.

Pierce (2013) employed a multiple baseline across participants design to examine the effectiveness of VSM on target social behaviours (pausing, eye contact, and social initiations) with four individuals (19-22 years, two males, two females) with ASD. Following viewing their individual VSM's which varied between 2.15 minutes and 4.15 minutes in length, the

participants were informed they were then to participate in a conversation with the therapist or were to 'hang-out' with the therapist. Two of the participants exhibited rapid behaviour change with the implementation of the VSM however two other participants required further intervention (verbal prompts) before sizeable behaviour changes were observed. Furthermore, generalisation probes across therapists displayed mixed results as some participants' behaviour changes generalised and other participants' performances were unstable, and the generalizability of skills for one participant was only assessed during baseline.

Functional Skills

Burton et al. (2013) used a multiple baseline across four adolescent male participants diagnosed with ASD to assess the effects of VSM on their functional mathematic skills. The participants were required to view 3-5 min video's of themselves performing functional maths skills, estimating the amount of money required to pay for a specific item and the change to be received, four times per week, twice per day. Participants were scored against a 7-step task analysis which included: "Read the story problem or watch the video model on the iPad; Identify the cost of the item listed on the price tag by circling the price; Estimate the amount to be paid using smallest number of bills by writing the estimate; Give the money to the teacher; Estimate about how much change you should get back (within $0.50) by writing the estimate; Calculate and write the exact amount you should get back; Use the cash register to make exact change using the fewest possible bills and coins" (Burton et al., 2013, p. 70). The criterion was set at 80% accuracy over 3 or more consecutive sessions. Through visual analysis and interpretation Burton et al. (2013) reported a strong, and functional relationship between VSM and all four participant's accuracy of calculating five functional mathematic problems. Furthermore, the participant's change in behaviour was rapid and maintained during the follow-up phase.

Therefore in summary, all six studies identified utilised single case research designs with limited numbers of participants (ranging from 2 to 4) thus threatening the validity of the research. Additionally, one study (Buggey, 2012) reported no changes in behaviour potentially due to the young age of the participants (3 years). A similar study (Buggey et al., 2011) also reported no change in their youngest participant (3 years). Ohtake et al. (2014) found that although the VSM lead to rapid behaviour change, further intervention was required for one participant to eliminate the entirety of their maladaptive behaviours. In general the research reported rapid behaviour change (Bellini et al., 2007 Burton et al., 2013, & Ohtake et al., 2014), which was maintained and exhibited significant variability between participants (Buggey et al., 2011, Goh & Bambara 2013, & Ohtake et al., 2014). However, only one of the studies identified examined generalizability of the participants' newly acquired skills/behaviours (Pierce, 2013) which exhibited mixed and unstable results. This literature search suggests VSM can be an effective intervention for teaching persons with intellectual impairments such as ASD, over the age of 3 social and functional skills, which may be maintained when the intervention is withdrawn.

Overall, the average number of sessions before a significant improvement in behaviour was observed in each study ranged from 1 to 5.6 sessions, indicating that when effective, VSM resulted in rapid changes in performance. Similarly, the average number of sessions before participants met criteria in the identified VM studies ranged between 1.53 to 6 sessions . Thus, suggesting both intervention modalities can be a rapid and effective means of teaching social and functional skills which may be generalised, to persons with intellectual impairements such as those diagnosed with ASD.

Comparing Video Modelling and Video Self-Modelling

The literature indicates that both VM and VSM are effective teaching methods in various situations and with various populations. As Dowrick (1991) indicates, VM may be more economical however when individualisation is neccesary or the self-element has a special significance, VSM may be more appropriate. Dowrick (1991) further emphasises, the question is not which one is better but rather *when* is one *more effective* . Furthermore, as VM and VSM videos are typically only 2-3 minutes long, and are typically only viewed a small number of times (for example 6 times over a 2 week period, Dowrick,1999), both interventions are fast, likely to minimise stress on the student, and also likely to cost less in the long term in comparison to other interventions (Dowrick, 2012; Brown & Middleton, 1998). Additionally, VM and VSM techniques have been shown to effectively generalise to real world environments, potentially due to the realistic representations of real life scenarios and settings (Clark, Beck, Sloane, Goldsmith, Jenson, Bowen, & Kehle, 1993). Generalisation is particularly important as Tingey (1988) indicates, all children, even those without disabilities, have difficulty learning behaviours/skills in one setting and applying them in another setting.

An advantage of VSM is its cultural safety. As Dowrick (2012) notes, the images the individual is observing is of him or herself therefore, the images are of his or her own culture. This can also be true for VM as it is recommended the model and the observer are as similar as possible, therefore this includes matching cultural backgrounds.

The limitations of the research on VM and VSM need to be taken into consideration. Because of the individualisation of VSM and to an extent VM, single case designs are commonly implemented where the individual acts as his or her own control at baseline therefore, demonstrating the effects of the intervention when the intervention is introduced (when they have viewed their VM/VSM) not beforehand (during baseline). Due to this necessary individualisation of VM and VSM research no large-scale, group treatment studies have been

conducted on their effectiveness. All the studies identified thus far have been single-case designs where data was collected for a small number of participants. Additionally, there may be some individuals for whom this method is developmentally inappropriate; however, the research indicates that VM has been effective for individuals with ID's. Dowrick (1991) hypothesises that this could be partly due to the visual rather than language-based component, therefore, although not extensively studied with individuals with DS, it is predicted that the method will be developmentally appropriate for this population.

A literature search was conducted with the search terms video model* AND video self-model* AND down syndrome OR intellectual disabilit* OR developmental disabilit* OR mental retardation. The search engines utilised were ERIC, Education Research Complete, Google Scholar, PsycARTICLES, PsycINFO, and Psychology and Behavioural Sciences Collection. Studies which used VSM and VM as the sole interventions (without other intervention modalities such as reinforcement or prompting) were included in the review to assess the independent effects and compare the effects of VSM and VM on teaching individuals with ID's target behaviours/skills. Studies which used point of view modelling, and continuous VM exclusively were excluded from the literature review as this technique was not utilised in the current study. Point of view VM refers to videos created from the participant/observers point of view. Continuous VM refers to VM videos that are formated to automatically repeat the VM again whilst the participant attempts the desired behaviour/s (Mechling et al., 2014). Table 3 depicts the studies which fitted the above inclusion criteria.

Table 3

Studies comparing Video Modelling and Video Self-Modelling to teach people with intellectual disabilities functional, social skills, &/or academic behaviours/skills

Author	Participants	Dependent Variables	Target Behaviour/Skills	Intervention Results	Maintenance Results	Generalisation Results
Cihak & Shrader, 2008	Four men (16-21 years) ASD	Percentage of steps completed independently	Functional-Vocational and pre-vocational tasks	Positive, slight VSM preference	Positive, no preference Three & Six weeks post acquisition phase	N/A
Decker & Buggey, 2014	Two boys and four girls (8-12 years) specific learning disability	Words read correctly per minute	Academic – Reading fluency	Positive, VSM preference	Positive, no preference Immediately post-intervention	N/A
Marcus & Wilder, 2009	One girl (9 years) and two boys (4 & 9 years) ASD	Percentage of correct responses	Academic – Respond appropriately to novel letters	Positive, VSM superior	N/A	N/A
Ozkan, 2013	Two girls and one boy (9-14 years) ID	Percentage of correct responses	Functional – First aid skills	Positive, no preference	Positive, no preference One or two weeks post-intervention	Positive Peers, body parts, materials used
Sherer, Pierce, Paredes, Kisacky, Ingersoll, Schreibman, 2001	Five boys (3-11 years) ASD	Average percentage correct engagement in conversation	Social - Answer and reciprocal conversation questions at school and home	Mixed, no preference	Mixed, no preference 2 months post-intervention	Mixed, no preference Setting and peers

Social Skills

Sherer et al. (2001) used a multiple baseline and an alternating treatments design to compare the effectiveness of VM and VSM to teach five boys (5 – 11 years) with ASD to respond appropriately to social questions at home and school. The participants were required to view their VSM or a VM of a model engaging in conversation with an adult, respectively on alternating days. Sherer et al. (2001) reported mixed results as one participant exhbited a preference for VM as they met criteria after 7 VM sessions in comparison to meeting criteria after 15 VSM session. Two participants did not meet criteria with VM or VSM therefore exhibiting no difference, and one participant met criteria after 6 VSM sessions and then met criteria after 5 VM sessions therefore additionally exhibiting no difference between VM or VSM. These results were maintained two months post-intervention and were generalised across peers and settings. Therefore, Sherer et al's (2001) findings indicate that, for these participants, VSM and VM were equally effective for teaching discrete social/communication behaviours to children with ASD .

Functional Skills

Cihak and Schrader (2008) utilised an alternating treatments design to examine the difference in effectiveness of VM and VSM in teaching four men (16 – 21 years) with ASD vocational and pre-vocational tasks. Each video was between 33 and 103 seconds in duration and included a male voice-over for each step of the individuaised task analyses. After viewing their video the participants were requested to attempt their set task. Cihak and Schrader (2008) reported that after a participant completed all required steps independently, verbal praise was given. This verbal praise may have been a motivating factor for the participant to attempt to perform the task successfully in the future and/or may have increased their self-efficacy of their ability to perform the task therefore potentially

enhancing their future performances of the set task. Furthermore, the participants may have been more inclined to exhibit positive behaviour changes due to the voice-over's outlining each step of the task analysis in each video. However, the results indicated that two of the four participants acquired their set tasks efficiently with VSM whilst the other two participants displayed no clear difference between VM or VSM. Overall VM and VSM were both effective for teaching all four men with ASD chained vocational tasks, these results were maintained three and six weeks post-intervention.

Ozkan (2013) employed an adapted alternating treatments design in order to compare the effect of VM and VSM to teach first aid skills to three children (2 girls, 1 boy, 9-11 years) diagnosed with ID's. The participants viewed 3-8 minute videos of first aid being carried out for bleeding or burns; the researcher brought the participants' attention back to their video if they became distracted. Such training was continued until participants correctly responded (100%) for three consecutive sessions. The results of the study indicate that VM and VSM were equally effective and efficient in teaching the individuals with ID's first aid skills as VM was more efficient for one participant, VSM was more efficient for another pariticipant, and no difference was observed for the third participant. These results were maintained one and two weeks post-intervention and were generalised across peers, body parts, and materials used.

Academic Skills

Decker and Buggey (2014) employed a multiple baseline across participants design with a comparison group to compare the effectiveness of VSM and VM to improve the reading fluency of six children (8-12 years) with learning disabilities. Participants were randomly allocated into either the VSM, VM, or comparison group. The participants viewed their video once daily and participated in twice-weekly reading fluency checks. Although

both VM and VSM resulted in improved fluency, Decker and Buggey (2014) reported that two children in the VSM condition made more "substancial and immediate gains" (p. 167) than any of the other participants. The comparison group additionally made gains in reading fluency however these were slow in comparison. The fluency gains all participants made were maintained upon the removal of the intervention.

Marcus and Wilder (2009) utilised a multiple baseline and multielement design to compare the effect of VM and VSM to teach three children (4-9, two boys and one girl) diagnosed with ASD appropriate responses to novel letters. Participants each viewed a VM and a VSM of the model answering the therapists questions i.e., "what letter is this?". The participants individually viewed their VM or VSM three times a day for two consecutive days prior to the sessions with the therapist beginning, then once immediately prior to their session. Following the first session, each participant was then required to view their other video (VM if they viewed VSM first or vice versa) three times a day for two consecutive days prior to the session with the therapist, then once immediately prior to their session. The order in which participants viewed their video's (VM or VSM first) was randomly selected by the researcher). Marcus and Wilder (2009) reported that in the VSM condition all participants met criterion however, in theVM condition only one of the three participants met criterion. Furthermore, the participant that met criterion in both VSM and VM conditions, met criterion faster in the VSM condition. Thereforem Marcus and Wilder (2009) suggest that for teaching children with ASD textual responses, VSM may be more superior to VM.

In summary of the studies identified which examine the difference in effect between VM and VSM for teaching individuals with ID's new behaviours/skills, it appears as though both VM and VSM can be effective and efficient methods which produce behaviour/skill maintenance (up to 2 months post-intervention) and generalisation. The Bellini et al. (2007) meta-analysis of VM and VSM interventions for children with ASD additionally found both

VM and VSM interventions to be effective in teaching the children desired functional or social behaviours/skills. However, of the studies identified in the current literature search, where differences were demonstrated they were in favour of VSM, especially in terms of efficiency as some participants acquired the desired behaviour/skills faster with VSM in comparison to VM (Cihak & Shrader, 2008; Decker & Buggey, 2014; Marcus & Wilder (2009). Decker and Buggey (2014) suggest that participant preference for VSM demonstrated in their study may be due to enhanced confidence or self-efficacy as teachers and parents reported greater confidence and attidude in the VSM group.

Although the research demonstrates VSM may produce more efficient results in comparison to VM, both intervention techniques effectively lead to positive behaviour changes. Therefore Decker and Buggey (2014) indicate that in some complex situations creating a VM may be more cost-effective in comparison to VSM when participant cooperation, obtaining quality footage, and video editing are taken into consideration. Sherer et al. (2001) additionally emphasise the potential benefits of using VM over VSM as VM videos are typically easier and faster to create. However, Sherer et al. (2001) additionally acknowledge that individuals are more likely to enjoy viewing VSM videos and thus, may attend more to their video. Cihak and Schrader (2008) additionally suggest that in comparison to VM, VSM may assist in increasing an individual's self-efficacy and viewing themselves succeed may increase the "reinforcing value" (p. 20).

Similarly to the previous two literature searches, the studies found included mostly ASD participants (Cihak & Schrader, 2008; Marcus & Wilder, 2009; Sherer et al, 2001) and all studies identified employed single-case designs with few participants (1-5) therefore limiting the validity of the research.

Social Stories

Social Stories[TM] (SS) were orignically developed to help children with ASD understand and manage social situations better and cope more effectively with changes (Ali & Frederickson, 2006). As Gray and Garand (1993) explain, SS are brief individualised stories that describe specific social situations and define appropriate response options. The information introduced is visual and static which research suggests is important for individuals with developmental disabilities (Bernard-Ripolli, 2007; Barry & Burlew, 2004). The Gray Centre (2006) emphasises that the goal of a SS is to help the individual better understand a social situation, not to evoke behaviour change. However, although there is minimal empircal evidence to support the effectiveness of SS as an intervention (Barry & Burlew, 2004; Iskander & Rosales, 2013), research which incorporates SS within intervention packages report the positive effects a SS can have on behaviour change (Elder, 2002; Barry & Burlew, 2004; Iskander & Rosales, 2013; Matson, Matson, & Rivet, 2007; More, 2012; Test, Richter, Knight, and Spooner, 2011). An emerging and effective intervention package is the combination of video modelling and SS's to teach children with developmental disabilities social skills (Kagohara, Achmadi, van der Meer, Lancioni, O'Reilly, Lang, Marschik, Sutherland, Ramdoss, Green, & Sigafoos, 2013).

A SS aims to describe a character's actions, thoughts, and emotions as they complete a task which is broken down into the specific component skills which make up the task (Gray, 1995; Gray & Garand, 1993). SS's are made up of four different types of sentences, directive and descriptive that are reccommended to exist with a 1:2-5 ratio, respectively and perspective and affirmative sentences (Gray, 2000). Directive sentences consist of sentences which describe desired responses to the specific social situation and are recommended to begin with 'I will try to…' (Ali & Frederickson, 2006). Descriptive sentences are factual statements which may attempt to answer potential questions the individual may have about

the social situation such as 'why' questions. Perspective sentences attempt to describe an individual's internal state of being or their feelings/beliefs about a specific topic or situation for example, 'my sister loves chocolate'. Affirmative sentences are likely to include shared cultural beliefs and values for example, 'it is important to wear my sunhat' (Ali & Frederickson, 2006). Gray and Garrand (1993) emphasise the importance of personalising an individuals social story to ensure they are written from the individual's perspective and for their comprehensive level. An SS can be personalised by adding realistic pictures of the individual in the specific setting, attempting the specific task, and/or with the people or events adressed (Gray, 2004; More, 2012). It is important for the comprehension of the SS to be checked, therefore comprehension questions at the end of the story are common to ensure the SS is at the appropriate level for the individual (Gray & Garrand, 1993).

Video SS's are also a common method for delivering the SS. A video SS allows the story to be both read-allowed to the individual (with the volume on) and for the individual to read along with the story at their own pace (with the volume on or off) as one page of the story appears on the screen at a given time (Gray & Garrand, 1993). Although not acknowledged in the literature, SS's are evidently print variants of SM.

Current Study

In conclusion of my review of the relevant literature, although there are many effective studies demonstrating the acquisition of cash money skills with children and young adults with ID's no empirical studies have been conducted assessing the acquisition of electronic transaction skills with young adults with Down syndrome. Furthermore, although research indicates VM and VSM techniques are an effective and rapid method for teaching children and young adults many skills including purchasing skills, it is not clear if they would be effective for teaching young adults with DS how to use an EFTPOS card to independently

complete purchases in a supermarket and for this skill to be generalised across different supermarkets. Additionally, it is not known if VM or VSM is more effective in teaching this skill. Therefore, I have constructed the following research questions:

1). Is there a difference in *rate* of acquisition of electronic transfer skills evident in a student taught with Video modelling compared to a participant taught with Video self-modelling?

2). Is there a difference in *retention* of electronic transfer skills evident in a participant with Video modelling compared with a participant taught with Video self-modelling?

3). Is there a difference in *proportion* learnt of electronic transfer skills evident in a participant taught with Video modelling compared to a participant taught with Video self-modelling?

4). Is VM or VSM more effective in rapid learning and retention of electronic money skills?

CHAPTER 3: Method

Design

A non-concurrent single-case multiple baseline across yoked participants design was employed to compare the effectiveness of VM and VSM on the participants' ability to independently complete electronic purchases in community settings with their EFTPOS cards.

Core features of single-case research designs include: repeated measures, visual analysis, and clear treatment effects. Repeated measures of the dependent variable are collected from each of the participant's over time. Therefore with graphical presentation and visual analysis of the data, judgments regarding data trends and the relationship between the dependent variable and independent variable can be made. Visual analysis allows for the variability, level, and trend of the data to be examined within and between participants. Data variability refers to how variable or consistent specific data points are, level refers to the location of data points in relation to minimum and maximum values, and the trend of the data refers to systematic patterns (increases/decreases) in the path of the data, a minimum of three data points are required to assess level reliably. With repeated measures and visual analysis of variability, level, and trends in the data clear treatment effects can be assessed between baseline and intervention phases therefore, enabling convincing support that the independent variable likely caused the changes of the dependent variable. These core features exemplify the goodness of fit for a single-case across yoked participants research design to be employed with this study as analysis of single individuals can be made as individual treatment effects can be assessed both within participants and between yoked pairs (Blampied, 1999).

The single-case design employed in this research additionally allows for internal and external validity to be achieved. Internal validity refers to changes in the dependent variable being attributable to the introduction of the independent variable, not extraneous variables and therefore increases confidence in the functional relationship between the independent and

dependent variables and thus, results and conclusions drawn (Richards, Taylor, Ramasamy &

Richards, 1999). In this study internal validity was strengthened with the use of a multiple

baseline design as functional relationships may be demonstrated only with the introduction of the

intervention (Hayes, Barlow, & Nelson-Gray, 1999). Additionally, experimental control was

employed as the participants served as their own controls and baseline conditions (lengths) were

randomly selected for each yoked pair (Barlow, Nock, & Hersen, 2009). In contrast, external

validity refers to the generalizability of a study's results across individuals and/or settings in

similar studies and is important for inferring causal inference (Richards et al., 1999). External

validity can be achieved by replication of findings as successful replication of the study's results

contribute to enhanced confidence that the intervention will generalize to other individuals

and/or settings. Therefore, this study consisted of three yoked participants to establish efficacy as

research (Barger-Anderson, Domaracki, Kearney-Vakulick & Kubina, 2004; Richards et al.,

1999) suggests three to four replications to convincingly demonstrate experimental control and

treatment effectiveness. Inter-observer reliability was also established in this study to improve

confidence of the dependent variables measurement; this is discussed in more detail later

(Richards et al., 1999).

A yoked control procedure is where the participants are yoked, or joined together in

pairs, and receive the same intervention or reinforcement however with different contingencies

(Salkind, 2010). In this study, by yoking participants, the effect of VM versus VSM can be

analysed between yoked participants in addition to the effects of the specific VM or VSM

intervention on each individual participant. Participants were yoked together according to their

commonalities (gender, age) to ensure participants in the VM condition had models with similar

likeliness to themselves and to increase the interventions effectiveness (Ayres & Langone,

2002). Within the yoked pairs each participant was randomly assigned to either a VSM or VM

condition. Participants in the VSM condition viewed their VSM videos during the intervention

phase and the participants in the VM condition viewed the VSM of their yoked pair during the intervention phase. Each yoked pair was randomly assigned a baseline conditions (1, 2 or 3). Baseline 1 involved the yoked pair completing one set of baseline probes within a week, the yoked pair assigned to baseline two completed two baseline probes within a week, and participants in the third baseline condition completed three baseline probes within a week to allow for incidental learning to occur.

This research benefitted from employing a multiple baseline design as the intervention results in learning which can not be reversed (or forgotten) if the intervention is withdrawn (Barlow & Hersen, 1984). Therefore returning to a baseline phase is not plausible as in common single-case reversal designs. In this research the length of baseline (baseline condition) was randomly selected to increase the validity of the study. An ethical consideration is that prolonged baselines may not be educationally/ethically sound, especially if the participant requires the intervention on a more immediate basis; however in the case of this study this was not likely to be the case (Barger-Anderson et al., 2004). Furthermore, as the intervention was introduced after a stable baseline was established (relatively consistent level, trend, and variability of at least three data points), this design depicts funtional relationships as the independent variable is introduced (Barger-Anderson et al., 2004).

Overall change in the ability to independently complete electronic purchases with an EFTPOS card was measured through the use of staggered baseline probes, intervention probes, and follow-up generalisation probes two weeks after the completion of the intervention. The intervention consisted of an instructional video created from the footage of the participant him or herself (VSM condition) or the footage of their yoked pair (VM condition). Participant's in the VM condition received their yoked pair's VSM to ensure both yoked participant's received the same instructional video of an individual performing the required task (Hood, 2004).

Ethics

      Approval from the University of Canterbury's Human Ethics Committee was obtained following registration of this thesis proposal and prior to any information/data collection.

Participants

      Participants were six young adults (13-21 years of age, M= 15 years, SD= 2.86) diagnosed with Down syndrome (DS), whose parents were concerned for their safety in regards to using EFTPOS cards independently. Participants were recruited from a weekly social club for young individuals with DS in Canterbury. Information on the study was included the social club's newsletter with details for potential participants and their parent/s to get in contact with the researcher if they were interested (Appendix A, C). Demographic data including age and gender of participants is listed in table 1, names are pseudonyms to ensure anonymity of the participants.

Table 4

Participant pseudonyms and demographic information

Name	Age (years)	Gender	Condition
Participant 1	17	Male	VM
Participant 2	21	Female	VSM
Participant 3	14	Female	VM
Participant 4	14	Female	VSM

| Participant 5 | 13 | Female | VM |
| Participant 6 | 13 | Female | VSM |

Inclusion criteria included factors such as being able to speak and understand English (to be able to participate in conversation/communicate with cashier); the visual ability to make selections on EFTPOS terminals; the ability to read enough that they could recognise and differenciate between CHQ, SAV, CRD, Accepted, Declined and other words and numbers which may appear on the EFTPOS terminal screen. Participants were also required to have the fine motor skills to be able to pull out an EFTPOS card from their pocket/wallet; swipe/insert it; and make selections on the EFTPOS terminal. Lastly, participants were required to have prior, or have the ability to be taught, basic knowledge of the component parts that make up an EFTPOS transaction, such as being able to remember a four digit number sequence and keeping this number a secret. Lastly, participation of the participant's parent/s at the screening interview of the study was also a pre-requisite of the study as all participants required a parent/s who were willing and able to support them (i.e., arranging travel for the participants and controlling the amount of money available on the participants EFTPOS cards).

Although no participants were excluded from the study, young adults with high levels of externalizing maladaptive behaviours were to be excluded, in cases where such problems had the possibility of causing harm to themselves or others around them. Additionally, any participants who completed the initial screening task analysis with 80% accuracy or higher were to be excluded from the study as their skill level would have been too high for this program to be of any help. The parental-set spending limits for the participants were set between $5 and $40 per purchase and the general amount made available on the participants EFTPOS cards was between $20 and $100.

Participant 1 was a 17 year old male diagnosed with Down syndrome. Participant 1 had a speech impediment however he was able to communicate with the researcher effectively during the initial interview and therefore met inclusion criteria to participate in the study. Prior to the commencement of the study Participant 1 did not have an EFTPOS card. During the initial interview participant 1's parent's reported that he experienced three different opportunities each week to shop including once a week in a café where he purchased the same items each week which amounted to $7 (cash money), once a week with peers from school at a café where he was given $10 to purchase lunch, and once a week after swimming class where he purchased snacks with cash money from a vending machine. Participant 1's parents reported that although he enjoyed going grocery shopping at the supermarket he had had no recent experiences of doing this. Participant 1's parents indicated that they hoped after the program their son would have more independence and be able to use his EFTPOS card when with his peers. Furthermore, his parents' concerns were monitoring his spending and ensuring he kept receipts from purchases. Participant 1 indicated that he felt "happy" when shopping currently and would like to learn how to use his EFTPOS card to purchase items. He was also able to successfully complete each task asked of him during the initial interview.

Participant 2 was a 21 year of female diagnosed with Down syndrome. Participant 2's mother indicated during the initial interview that before the study Participant 2 was reluctant to shop perhaps due to a lack of confidence. Prior to the commencement of the study Participant 2 did have an EFTPOS card however had not yet activated a PIN number therefore was not able to use her EFTPOS card. Participant 2's mother reported that each fornight Participant 2 went swimming then shopping and during this excursion is prompted to pay with cash however she had not been confident doing so. Participant 2's mother indicated that she hopes at the end of the program her daughter will have more independence for the future. Participant 2 reported during the initial interview that she wanted to learn how to use EFTPOS and that she felt "good" when

shopping currently however would feel "less good" if she was required to do so by herself. Participant 2 completed each requested task during the initial interview successfully.

Participant 3 was a 14 year old female diagnosed with Down syndrome. Prior to the commencement of the study participant 3 did not have an EFTPOS card. Participant 3's mother reported during the initial interview that she regularly took Participant 3 to the supermarket where she had her own list of grocery items to locate (usually familiar items as she occasionally had difficulty locating items) and on occasion used coins to pay for an item/s. Participant 3's mother stated that she hoped her daughter would become more familiar with EFTPOS, develop some self-discipline and focus/concentration throughout the program. Participant 3 stated that she felt "happy" about learning to use her own EFTPOS card and going shopping currently. Participant 3 additionally reported feeling "happy" about purchasing items independently currently and stated, "I like to pay". During the initial interview Participant 3 successfully completed each requested task.

Participant 4 was a 14 year old female diagnosed with Down syndrome. Prior to the commencement of the study Participant 4 did not have an EFTPOS card of her own. Participant 4's mother reported that she regularly took Participant 4 grocery shopping, she had her own list, collects items of her list independently, then they meet at the check-out for Participant 4's mother to pay. Participant 4's mother indicated that she hoped her daughter would have more independence on completion of the study. During the initial interview Participant 4 reported she would like to learn how to use an EFTPOS card to purchase items, that she feels "happy" and "enjoys" going shopping currently and would feel "happy" and "excited" if she was required to purchase an item/s independently at the supermarket currently. Participant 4 correctly completed each requested task during the initial interview.

Participant 5 was a 13 year old female diagnosed with Down syndrome. Prior to the commencement of the study Participant 5 did not have an EFTPOS card. During the initial

interview participant 5's mother reported that Participant 5 frequently goes with her to the supermarket and enjoyed scaning the groceries and her FlyBuys coupon card, and could choose and locate items when allowed. Participant 5's mother indicated that she would like her daughter to learn how to use EFTPOS and to shop "better" for example not grabbing items on the shelves at random. Participant 5 reported that she would like to learn how to use an EFTPOS card to purchase items, that she feels "happy" when she is shopping currently, and would feel "excited" if she was requested to purchase an item/s independently at the supermarket currently. Participant 5 completed each task requested successfully during the intial interview.

Participant 6 was a 13 year old female diagnosed with Down syndrome. Prior to the commencement of the study Participant 6 did not have her own EFTPOS card. During the initial interview Participant 6's mother reported that Participant 6 would go to the supermarket with her and can locate and select her own items and was beginning to understand which items are cheap and which are too expensive however, at the check-out Participant 6's mother pays. Participant 6's mother indicated that she hopes her daughter will be have a better understanding of the concept of having a certain amount of money and not being able to purchase items more expensive than this, on completion of the program. Participant 6 indicated that she would like to learn how to use an EFTPOS card to purchase items because it will be easier for her to "get things [she] wants". Furthermore, Participant 6 reported that she currently feels "amazing" when buying things at the shop currently and would feel "fabulous" if required to purchase an item/s independently at the shop now. Participant 6 completed each requested task successfully during the initial interview.

Setting

The initial screening interview with individual participants and their parent/s took place at the University of Canterbury in a low stimulus clinical interview room or at the participant's family home. The place and time was mutually agreed with the participants and their parent/s.

The baseline phase occurred individually in a local supermarket and at the University of Canterbury in a low stimulus clinical interview room. The allocated supermarket was chosen as it was located near a major city bus route and was close in proximity to both the University of Canterbury and the participant's social club (home-base). Prior to participant recruitment the researcher obtained informed consent from the allocated supermarket's owner/operator.

Materials

A T7+ EFTPOS machine was supplied to the researcher which was used during the baseline probes. The EFTPOS terminal was set to 'training mode' to ensure no funds were transacted however the purchasing process was still the same as in the community. The simulated environment included a pretend grocery supermarket made out of cardboard (approximately 2m by 1m) and a pretend chocolate bar (polystyrene wrapped with a DairyMilk Chocolate wrapper. At the allocated local supermarket which was used during baseline, intervention and follow-up generalisation phases, the EFTPOS terminal in-use was the Ingenico iPP350. During the follow-up generalisation phase at the alternative supermarket chain the EFTPOS terminal in use was the Verifone VX820. It is not known which EFTPOS terminals were in-use by the different dairy's used in the follow-up generalisation phase.

A Canon LEGRIA HF20 digital camcorder was used to film the participants, this footage was transferred via USB cable onto a MacBook Air 15" (2013) to be edited on the iMovie programme (2013) and Microsoft PowerPoint (2013) was used to construct the SSs. The participants were individually filmed with close-up shots of the EFTPOS terminal and medium

shots with the participant, cashier and EFTPOS terminal. The self-modelling videos were made for each individual participant and depicted the participant performing the task independently. Each video was less than 2 minutes long after editing, ended with 'The End" and was then transferred onto a DVD for the individual participant. The participants were then able to view their VSM or VM on their choice of DVD-friendly personal devices (home computer, DVD player, etc.) in full screen view with the volume up to an appropriate level. All participant's were given their individual VSM on completion of the study.

Three Social Stories (SS's) were developed from a modified social story format according to Gray and Garand (1993), Gray (2007, 2010, 2010a), and Gray, White, & McAndrews (2002). The SS's were created using Microsoft PowerPoint (2013) using narration recording for the text, each slide had an individual timing and the whole slideshow was saved as a movie before being compiled onto the participant's individual DVD using DVD Maker Pro. The first SS explained the concept behind EFTPOS transactions (Appendix M), the second SS explained the importance of PIN number secrecy and suggested behaviours (Appendix N), and the third SS described a coping strategy for unexpected occurances such as their EFTPOS card declining in store, and suggested responses (Appendix O). The title page of each SS contained a black PowerPoint slide with centered, white, Calibri 44-point font above a centered picture of either the participant completing a task (i.e., holding their EFTPOS card), an object (i.e., the participant's EFTPOS card), or a clip-art (i.e., shop). The remaining slides of each SS were constructed of black PowerPoint slides with a centered grey box placed approximately 1 inch from the bottom of the slide with one-two sentences in black Calibri (Body) 32-point font and a centered picture (of the participant, an object, or clip-art) in the middle of each slide. Each of the SS's was between 6 and 9 slides, inclduding the title page. Following the creation of the SS's, the researcher additionally designed a set of short comprehension questions (Appendix P) to aid parent-child discussions on EFTPOS safety, and determine each participant's approximate level

of understanding around EFTPOS safety. The comprehension questions were in Arial black 12point font and were printed on white A4 paper. The questions consisted of between two and five questions per SS and answers were multiple choice.

Assessment/Measures

The researcher created an initial interview schedule (Appendix J) to screen participants and assess their eligibility to participate in the study. This interview schedule was based on the inclusion and exclusion criteria implemented by the researcher and was designed to assess each participant's prior ability and/or ability to be taught, basic knowledge of the component parts that make up an EFTPOS transaction. The screening interview employed items adapted from the Vineland-II Adaptive Behaviour Scales subtests, daily living skills (Community), motor skills domain (fine), and maladaptive behaviour index (Sparrow, Cicchetti & Balla, 2008).

The researcher created an observation schedule (Appendix K) to record the number of task analysis (Table 5) steps the participant completed independely during each baseline, intervention and follow-up generalisation probe. Interobserver reliability data collectors were also given this observation schedule and observed every fourth data session during each phase. The first column was labeled "Correct (within 10 seconds)", ticks were indicated in this column if the participant accurately and independently completed the specific step on the task analysis/observation schedule within 10 seconds. The second column was labeled "Incorrect", ticks were indicated in this column if the participant required prompting from the cashier (i.e., they showed the participant how to swipe their card), if the participant incorrectly completed the specific step (i.e., only entered 2 digits for their PIN number), if the participant was not given the opportunity to attempt the step (i.e., if the cashier did not ask them whether or not they had a coupon/flybuys) and if the participant took longer than 10 seconds to complete the specific step

on the task analysis/observation schedule. A total percentage was calculated, (number of

"correct" responses divided by the number of "incorrect" responses multiplied by 100%). Table

5 depicts a 13-step task analysis of using an EFTPOS card to independently complete an

electronic purchase at a supermarket, a point of difference is made between 'social' steps (*) and

'pivotal' steps (**) which refer to the critical steps required to successfully complete an EFTPOS

transaction. The task analysis steps were developed in order to be applicable across a wide

variety of community stores as this was used during baseline, intervention and follow-up

generalisation probes.

Table 5

Task Analysis of an EFTPOS transaction

Step Number	Transaction Task
1.	Put item/s on check-out
2.	Greet cashier*
3.	State if coupon is present or not*
4.	State "EFTPOS please"*
5.	Wait for APM instruction
6.	Swipe/Insert EFTPOS card, or pass to cashier if required**
7.	Wait for APM instruction
8.	Select Account**
9.	Wait for APM instruction
10.	Select PIN number**
11.	Select "Enter" button**
12.	Wait for APM response
13.	If 'Accepted' ask cashier for receipt
14.	Leave store with goods**
13a.	If 'Declined', 'Incorrect PIN', or "Incorrect Account' ask cashier to try again
14a.	Repeat steps 5 to 14
13b.	If 'Declined again, thank the cashier and leave store without goods*

* Social Step
** Pivotal Step

During the intervention phase each participant was given a "Video Viewing Record"

(Appendix L) in order to record how many times and on which days they viewed either their

VSM or VM video. During the first day of the intervention phase, the researcher demonstrated how to do this to the participant and their parent/s by placing a tick in the first box after they had viewed the participant's VSM or VM video together.

Procedures

     Baseline. During baseline the participants first completed a probe in a simulated environment (at the University of Canterbury in a low stimulus clinical room), then completed a second probe in a community setting (local supermarket), then returned to the University of Canterbury and completed a third baseline probe in the simulated environment again. This set of three baseline probes was conducted in one day. As the design of the research was a multiple baseline across participants deisgn, the participants baseline lengths were staggered and randomly selected.

     During the simulated environment baseline probes, the researcher gave the participant the verbal prompt to "do your best to buy this pretend chocolate bar yourself". The researcher scored the percentage of correct responses the participant completed independently on the observation schedule (Appendix K). No teaching or cueing was given, only verbal praise to encourage the participant such as, "just do your best" or "what next?". After completing a simulated environment baseline probe the participant attempted to purchase an item in an allocated local supermarket. As the purpose of this study was to compare the effectiveness of VM and VSM as interventions alone rather than multidimensional intervention packages, praise was only given for attempting requested task/s not for error correction or improved performance. The participant chose a small item (i.e., a packet of potato chips) that they wanted to purchase, took this item to the check out and attempted to purchase it independently with the verbal prompt from the researcher, "Do your best to buy this [item] yourself". As in the simulated environment and all other intervention and follow-up phases only verbal praise was given to encourage the

participant such as, "just do your best" or "what next?". The researcher scored the participant against the observation schedule (Appendix K) to assess what percentage of correct steps the participant completed independently. After the community setting probe, the researcher and participant returned to the University of Canterbury to complete another baseline probe in the simulated environment.

One week following each participant's individual baseline probes the researcher and participant returned to the allocated local supermarket and completed the task analysis in a randomised order, to ensure no incidental learning occurred. Thus, all participant's completed the task analysis in the same randomised order during filming. Photograph's for each participant's individualised Social Stories (SS's) were screenshots taken from the video footage of their VSM video. The researcher edited the footage to ensure the videos were in the correct task analysis step-wise order for viewing and errors were removed to make the video appear as though the participant accurately performed all steps of the task analysis independently.

Intervention. During the intervention phase of the study, approximately one week following the creation of the participants' videos, participants were given two weeks (15 days) to watch their VSM or VM. Participant's parents received daily reminders to view their videos via text messages or emails from the researcher to ensure their child viewed the video. Participants were also given a viewing record (Appendix L) to score each time they viewed their video (VM or VSM). Participants were also given three individualised social stories each (Appendix M, N, O) and social story comprehension questions (Appendix P). Approximately every third day (5 times within the 15 day intervention period) the individual participant and researcher returned to the allocated supermarket to assess his/her performance against the task analysis. The same process that was applied in community baseline probes (researcher and Interobserver reliability collector standing approximately 1m away from the participant, minimal encouragers (for

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example, "what next?"), and no reinforcement given until leaving the supermarket) was applied during the intervention phase. On the last day of intervention (15th day) the researcher collected the participant's video (to ensure they did not watch it for two weeks), viewing record and SS comprehension questions.

Follow-up Generalisation. The follow-up generalisation phase consisted of the researcher and the individual participant attending three supermarkets two weeks post-intervention (the allocated local supermarktet, the alternative supermaret chain, and a Dairy) within a one week period in order to assess the participant's ability to maintain and generalise their independent EFTPOS purchasing skills within the community. Each participant selected an alternative supermarket chain and a Dairy of their (participant and their parent/s) choice. The alternative supermarket chain was selected by the researcher as they are a national supermarket present in many locations throughout Christchurch however their EFTPOS hardware differs from the allocated local supermarket. Dairy's were selected as their EFTPOS hardware also differs, the store itself is very different from national supermarket chains and many of the participant's parent/s indiciated that this is a likely place where the participant may be able to use their EFTPOS card independently in the future as most Dairy's were a very short distance from participants' homes. The same process used during the community baseline and intervention probes was utilized during the follow-up generalisation phase and the researcher (and inter-observer reliability data collectors for 25% of probes) scored the participant's ability to independently use their EFTPOS card to purchase an item against the task analysis/observation schedule. On completion of the follow-up generalisation phase all participant's were given a DVD with their individual VSM and Social Stories to keep.

Dependent Measures & Data Analysis

Changes in variability, level and trend in each participant's initial baseline performance were analyzed against their intervention phase and follow-up generalisation phase observations to identify any changes in performance before, during and after the intervention was implemented. The dependent measure was the percentage of steps of the task analysis correctly and independently performed. Each individual participant's performance was graphed onto a line graph for visual inspection. Performance across participants was additionally analyzed thus, changes within participant's and within yoked pairs were analyzed visually and compared to examine the effect of VM or VSM on the skill acquisition of each participant.

Reliability

Inter-observer reliability data was collected during 25% of baseline probes, 25% of intervention probes and 25% of follow-up generalisation probes. The interobserver reliability data collector scored the participant's reponses against the task analysis/observation schedule (Appendix K) and stood approximately 1m away from the participant to ensure she did not interfere with the process or distract the participant however she was able to observe necessary details. Inter-observer reliability was assessed similarly to that of Mechling, Gast and Barthold (2003), the number of agreements between the researcher and the inter-observer reliability data collector (point-by-point from the task analysis) was divided by the total number of agreements and disagreements, then multiplied by 100. Additionally differences in observers' perceptions were noted.

The mean Inter-observer agreement over the six participants' and all phases (baseline, intervention, and follow-up generalisation) was 93.54%: 89.28% for baseline phases, 95.71% for intervention phases and 96.42% for follow-up generalisation phases. These figures are within the

criterion suggested by Cooper, Heron and Heward (2007) when independent observers record observational data.

During baseline the greatest number of errors was due to a lack of visibility by the inter-observer reliability data collector of the APM buttons the participant was selecting during simulated environment probes. The inter-observer reliability data collector stood approximately one meter behind the participant, however the researcher was acting as the cashier and was therefore approximately 30cm away from the participant and the APM buttons they were pressing. During both intervention and follow-up generalisation probes proximity of the inter-observer reliability data collector and the researcher to the participant attempting the EFTPOS transaction was also the greatest contributing factor to the discrepancy between scores as the researcher stood in a position with a more direct line of sight to the participant.

CHAPTER 4: Results

The findings of the study are presented firstly with an examination of the participants Social Story comprehension results, secondly with an overall inspection of the effectiveness of both VM and VSM interventions in terms of participant performance against the task analysis, thirdly with an overall look at the efficiency of the VM and VSM interventions in terms of how many sessions were required by participants to meet criterion, and lastly a comprehensive analysis of results for each yoked pair and individual participants,
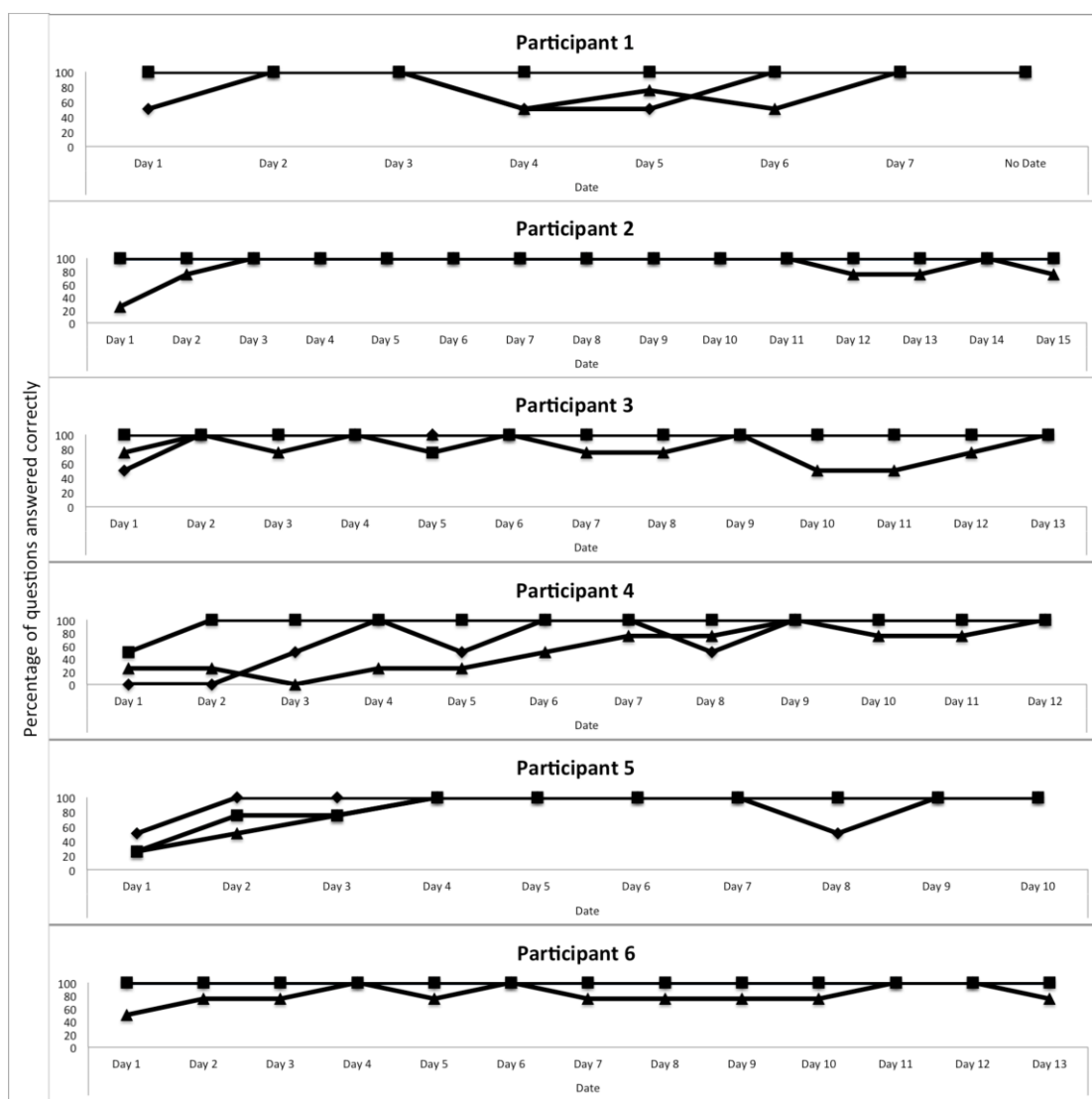

Figure 1. Graphical representation of Participant 1, 2, 3, 4, 5, & 6's percentage of correct responses to Social Story comprehension questions.

Social Stories

Figure 3 depicts the percentage of correct responses on the SS comprehension questions made by each participant during their 15day intervention phase. The average percentage across all 6 participants for the first Social Story (the concept behind EFTPOS, Appendix M) is 89.66%. Contrastingly, the average percentage for the second SS (PIN number safety, Appendix N) was 96.9% and 79.15% on the third SS (how to cope with unexpected events, Appendix O). Thus, participants in general attained lower scores on the third SS. This could be due to difficult comprehension questions or due to the third SS being longer with more complex information including more directive sentences. Furthermore, Gray (2000) Indicates that the percentage of directive sentences should be low in comparison to descriptive sentences (1:2-5) as SS's were traditionally designed to explain and describe social events and situations rather than teach individuals how to accurately respond to certain social events/situations (Gray & Garand, 1993). Participant 2's mother indicated to the researcher that the wording on slide 8 of the third SS ("Account Error") differed from the wording on the comprehension question that was targeting that slide ("Incorrect Account"), which she stated confused her daughter. This was an unintentional error.

During Participant 4's first intervention phase probe session her EFTPOS transaction 'Declined' as she did not have enough funds in her account to complete the transaction. When prompted by the researcher, "What do you do now?" Participant 4 responded, "leave my things here" which was encouraged in the third coping strategy SS, therefore Participant 4 demonstrated she learnt an appropriate coping response to an unexpected situation from the SS. Additionally, during Participant 6's first follow-up generalisation probe session her EFTPOS transaction also 'Declined'. When the researcher asked her "What do you do now?" Participant 6 looked at the cashier and stated, "Sorry, my EFTPOS card has declined, can I

try again please" and the cashier put through the transaction again. When her EFTPOS card declined the second time Participant 6 said to the cashier "Thank you" and she left the supermarket without her items. Although Participant 6 was visibly unhappy she successfully completed each step of the task analysis that she was given the opportunity to attempt and was given significant praise from her mother and the researcher for her responses to her EFTPOS card declining which she then also appeared proud of. Participant 6's mother reported that she was very pleased with how her daughter reacted to her EFTPOS card declining. It was clear that Participant 6 had learned from the third SS how to respond when her EFTPOS card declines as she repeated exact words from the third coping strategy SS to the cashier. Therefore, both Participant 4 and 6 demonstrated during independent intervention probes that the feed forward task was taken onboard.

Table 6

Average percentage of steps demonstrated correctly during baseline, intervention and follow-up generalisation for each

participant and experimental condition, and number of video views by each participant.

| | **Baseline** | **Intervention** | **Follow-Up Generalisation** | **Number of Video** |
	(%)	(%)	(%)	**Views**
VM	**24.95**	**68.12**	**70.63**	
Participant 1	28.56	81.41	80.95	8
Participant 3	23.80	48.56	45.25	17
Participant 5	22.49	74.40	85.71	10
VSM	**43.53**	**83.54**	**82.64**	
Participant 2	11.69	79.28	79.76	15
Participant 4	69.04	87.08	83.33	12
Participant 6	49.86	84.28	84.85	13
VM & VSM	*34.24*	*75.83*	*76.63*	
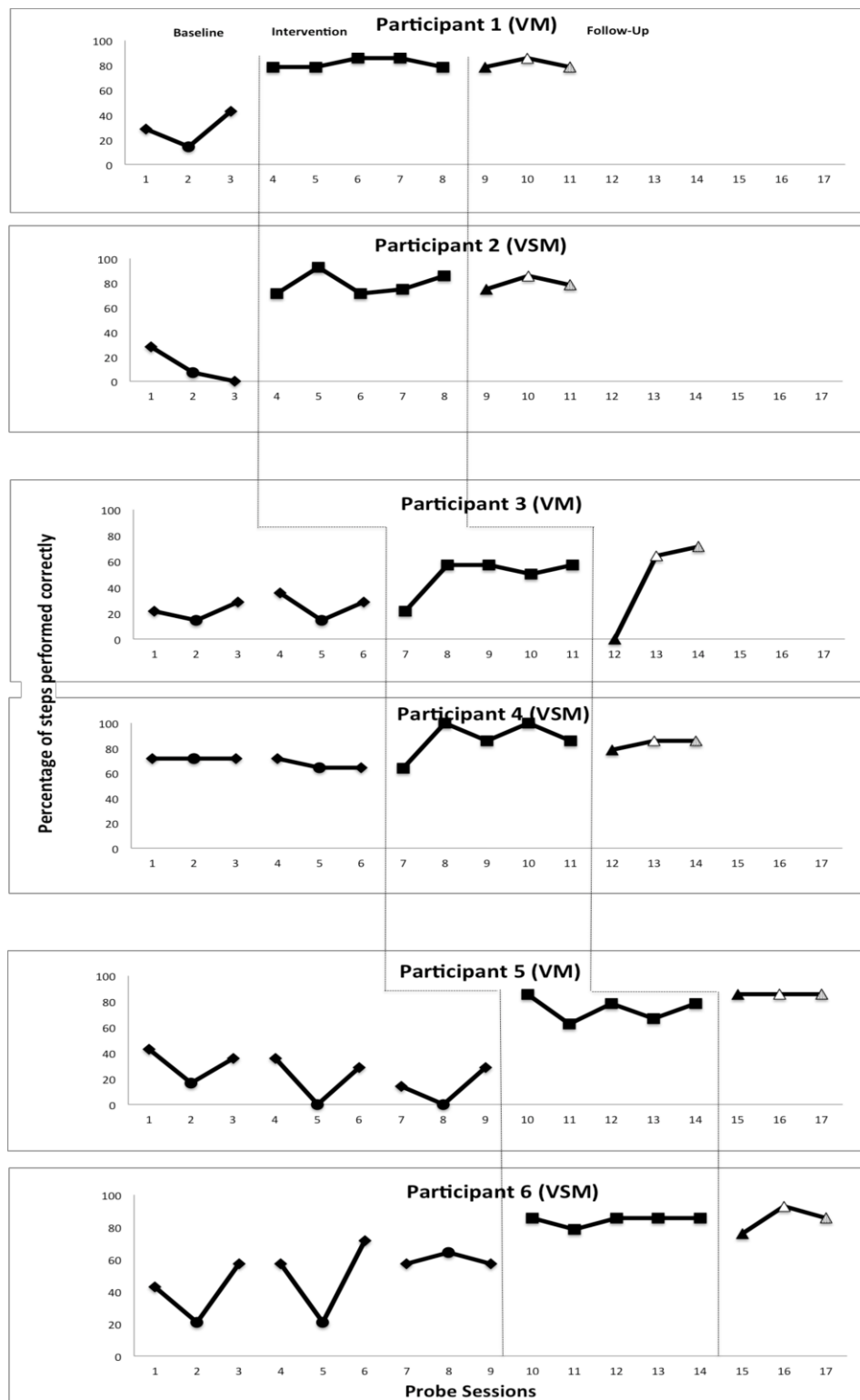
Figure 2. Graphical representation of Participant 1, 2, 3, 4, 5 and 6's percentage of steps of the task analysis demonstrated

correctly. Filled diamonds: Baseline simulated environment data; Filled circles: Baseline allocated community supermarket data;

Filled squares: Intervention data; Filled triangles: Follow-up allocated community supermarket data; Un-filled triangles: Follow-

up generalisation participant selected alternative supermarket chain data; Speckled triangles: Follow-up generalisation participant

selected Dairy data.

Effectiveness

Effectiveness refers to the amount of learning that occurred as a result of the intervention. The effectiveness of the VM and VSM interventions were inspected through visual analysis of the graphical representation of the data. Figure 1 depicts the percentage of steps of the task analysis correctly performed across baseline, intervention and follow-up generalisation phases for all six participants. As shown in Table 6, the data shows that the average percentage of steps performed correctly increased from 34.24% in baseline to 75.83% during intervention to 76.63% in follow-up generalisation phases. During the baseline phase, participants were most successful with the step of placing their item on the check-out, and entering their PIN number into the APM. However, participants in general did not respond to the cashier (i.e. to say "hello" or to state "EFTPOS please") and were unable to correctly follow the APM text instructions.
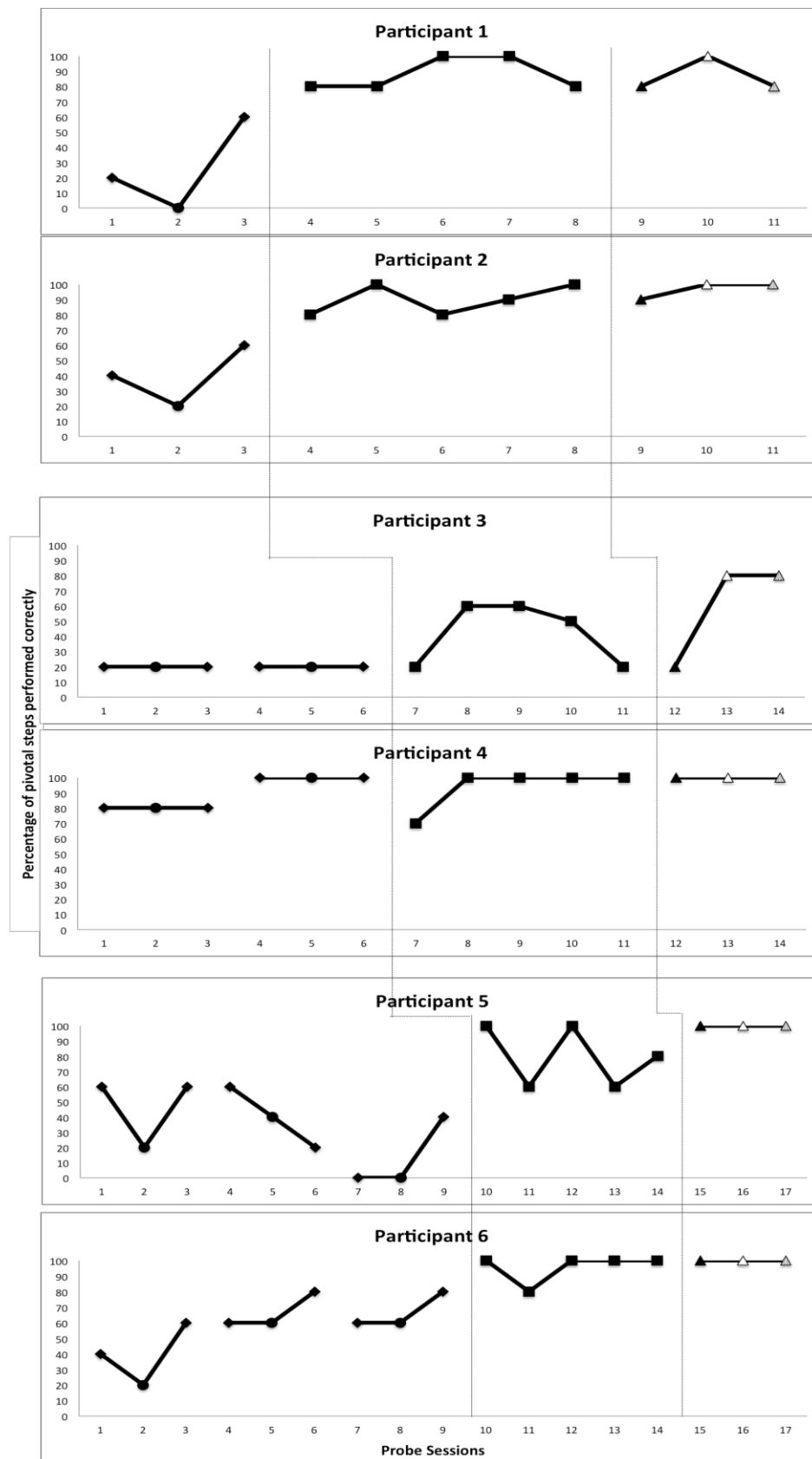
Figure 3. Graphical representation of Participant 1, 2, 3, 4, 5 and 6's percentage of pivotal steps of a successful EFTPOS

transaction demonstrated correctly. Filled diamonds: Baseline simulated environment data; Filled circles: Baseline allocated

community supermarket data; Filled squares: Intervention data; Filled triangles: Follow-up allocated community supermarket

data; Un-filled triangles: Follow-up generalisation participant selected the alternative supermarket chain data; Speckled triangles: Follow-up generalisation participant selected Dairy data.

Figure 2 depicts the percentage of pivotal steps of the task analysis required to successfully complete an EFTPOS transaction correctly performed across all phases and participants. The pivotal steps include steps 6, 8, 10, 11, and 14 of the task analysis: Swiping their EFTPOS card; Selecting their Account; Entering their PIN number: Pressing Enter; and leaving the supermarket with their goods. The pivotal steps do not include the social nuances, which are socially appropriate when purchasing items in a supermarket such as those included in the full task analysis. In general participants' that performed 80% or higher on the pivotal steps successfully purchased their selected item with their EFTPOS card. The data indicates that across VM and VSM conditions the average percentage of pivotal steps performed correctly increased from 46.66% in baseline to 81.66% during intervention and 90.55% in follow-up generalisation phases. Furthermore, the average percentage of pivotal steps performed correctly in the VM condition increased from 27.77% during baseline to 70% during intervention to 82.22% in follow-up generalisation phases. In contrast, the average percentage of pivotal steps performed correctly in the VSM condition increased from 65.55% during baseline to 93.93% during intervention to 98.88% in follow-up generalisation phases.

Table 6 additionally shows that participant's in the VSM condition on average viewed their video's more times than participant's in the VM condition (13.3 times on average and 11.6 times on average, respectively).

Efficiency

Efficiency refers to the speed at which behaviour change occurred and criterion was met as a result of the intervention. As opportunities not given for a task analysis step (i.e., cashier's

failing to ask the participant if they had a coupon/FlyBuys, or if they had "cash or EFTPOS?") were common and counted as incorrect responses, the highest percentage many participants were able to achieve during baseline, intervention and follow-up was 85.71%. Therefore, criterion for task acquisition was demonstrated when the participant successfully performed all steps of the task analysis that they were given the opportunity to attempt. As depicted in figure 1, Participant 5 and Participant 6 met criterion on the first session (85.71% and 85.71% after three days and four days of access to their view video's, respectively). Participant 2 and Participant 4 met criterion on the second session (92.85% and 100%, after six days and five of access to view their VSM's, respectively). Participant 1 met criterion on the third session (85.71%) after seven days of access to view his VM. Participant 3 did not meet criterion during baseline, intervention or follow-up generalisation probes however successfully and independently completed enough pivotal steps (as depicted in figure 2) to be able to purchase her selected item with her EFTPOS card during the last two follow-up generalisation probes. Thus, the two VM participants who did meet criterion did so on their 3rd and 1st session comparatively, the participants in the VSM condition met criterion on their 2nd, 1st, and 1st sessions, respectively. Therefore, although both VM and VSM were efficient interventions for evoking rapid behaviour changes, participants in the VSM condition experienced faster skill acquisition in comparison to participants in the VM condition.

First Yoked Pair: Participant 1 (VM) and Participant 2 (VSM)

Participant 2 was slightly less stable than Participant 1 in regards to performance against the task analysis (as shown in Table 1). However, both participants were efficient in terms of skill acquisition (Participant 1 met criterion on his third intervention probe session and Participant 2 met criterion on her second intervention probe session). Furthermore, no differences between in proportion learnt or retention of their skill acquisition were shown.

Participant 1. During baseline Participant 1 successfully performed an average of 28.56% of the steps in the task analysis with a median of 28.57% and a range of 14.28% to 42.85%. As depicted in figure 1, Participant's 1 baseline data were somewhat variable with a slight upward trend.

During intervention, Participant 1's performance was immediate, pronounced and consistent as it increased to an average of 81.41% (median = 78.57% range 78.57 to 85.71%) and showing a 52.58% average increase in skill acquisition from baseline.

During the follow-up generalisation phase, Participant 1's skills were maintained (78.57%) and he displayed generalizability of his learned skills at the alternative supermarket chain and Dairy (85.71% and 78.57, respectively).

Participant 2. During baseline Participant 2 successfully performed an average of 11.69% of the steps in the task analysis with a median of 7% and range of 0.07% to 28%. Participant 2's baseline data was slightly variable with a downward trend.

Participant 2 demonstrated rapid skill acquisition during intervention. Although the data shows some variability, an upward trend is evident. Her performance increased to an average percentage of 79.28% (median = 75%, range = 71.42% to 92.85%) showing an average skill acquisition of 67.59% from baseline.

Participant 2's skills were maintained at the follow-up probe (75%) and she displayed generalizability of her learned skills during the generalisation probes (85.71% and 78.57%, respectively).

Second Yoked Pair: Participant 3 (VM) and Participant 4 (VSM)

Participant 3 was more unstable than Participant 4 in regards to performance against the task analysis (as shown in Figure 1). Participant 3 did not meet criterion however was able to independently use her EFTPOS card to purchase selected items during the final two follow-up generalisation probe sessions as she successfully performed enough pivotal steps. In contrast, Participant 4's skill acquisition was very efficient (Participant 4 met criterion on her second probe session) and she displayed maintenance and generalisation of her learned skills during the follow-up generalisation phase. Therefore, differences between VM and VSM were exhibited within the yoked pair, as Participant 4's (VSM) data indicates she acquired the skill set more efficiently and with more stability, and learnt a greater proportion of the skill in comparison to Participant 3 (VM). However, it is important that the wellbeing and individual circumstances of each individual be considered.

Participant 3. During baseline Participant 3 successfully performed an average of 23.80% of the steps in the task analysis with a median of 24.99% and a range of 14.28% to 35.71%. Participant 3's data displayed relative consistency and a very slight upward trend.

Participant 3 demonstrated a rapid performance increase with a steady, slight upward trend during intervention as she increased to an average percentage of 48.56% (median = 57.14%, range = 21.42% to 57.14%) showing a 19.76% average increase in skill acquisition.

During the follow-up generalisation phase, Participant 3's skills were somewhat maintained. At the follow-up probe session Participant 3 successfully performed 0.07% of the task analysis. Therefore, failed to complete enough pivotal steps to be able to purchase her selected items. Participant 3 displayed generalizability of her learned skills during the generalizability probes (64.28% and 71.42%, respectively).

Participant 4. During baseline probes Participant 4 successfully performed an average of 69.04% of the task analysis with a median of 71.42% and a range of 64.28% to 71.42%. Participant 4's data was consistent and displayed minimal variability and a very slight downward trend.

Participant 4's performance increased to an average of 87.08% (median = 85.71%, range = 64% to 100%) showing an average increase in skill acquisition of 18.04%. Participant 4's data exhibited a prominent upward trend with slight variability as she successfully completed 100% of the steps of the task analysis during her second session.

Participant 4 demonstrated maintenance of her skills during the follow-up probe session (78.57%) and generalisation of skill acquisition during generalisation probes (85.71% and 85.71%, respectively).

Third Yoked Pair: Participant 5 (VM) and Participant 6 (VSM)

Both Participant 5 and 6's performances were unstable during baseline as in general they performed more poorly during community supermarket probe sessions. However, their performances stabilized during intervention and follow-up generalisation phases. Similarly, both participants met criterion on their first intervention phase probe session therefore acquired the skills with equal efficiency. As shown in figure 1, their skills were also maintained and showed generalisation. Therefore, Participant 5 and 6's data show that both VM and VSM were effective intervention treatments as no difference between rate of acquisition, proportion learnt, retention or generalisation of skills were demonstrated.

Participant 5. During baseline Participant 5 successfully completed an average of 22.49% of the steps in the task analysis with a median of 28.57% and a range of 0.07% to 42.85%. Participant 5 demonstrated variable performance with an evident downward trend.

Participant 5 exhibited immediate behaviour change with the introduction of the intervention with some variability however demonstrated a stable and positive trend. Participant 5's performance increased to an average of 74.40% (median = 78.57%, range = 62.50% to 85.71%) showing an average skill acquisition increase of 51.91%.

During the follow-up generalisation phase, Participant 5's skills increased to an average of 85.71% and remained at this level during both generalisation probe sessions (85.71% and 85.71%, respectively).

Participant 6. During baseline Participant 6 successfully completed an average 49.86% of the steps in the task analysis with a median of 57.14% and a range of 20.83% to 71.42%. As depicted in figure 1, Participant 6's baseline data showed significant variability with a pronounced upward trend.

During intervention Participant 6 demonstrated an immediate and stable positive behaviour change, increasing her average to 84.28% (median = 85.71%, range = 78.57% to 85.71%) thus showing an average skill acquisition increase of 34.42% from baseline.

Participant 6's skills were also maintained at follow-up (average of 76%) and demonstrated generalisation with both generalisation probe sessions (92.85% and 85.71%, respectively).

Comparison of Video Modelling and Video Self-Modelling

Participants in the VSM condition began the study with higher performance percentages when scored against the task analysis. Participants in the VM condition experienced a 45.68% increase in skill acquisition and participants in the VSM condition experienced a 39.11% increase (table 6). Additionally, participants in the VSM condition reportedly viewed their video more times on average (as shown in table 6).

CHAPTER 5: Discussion

Aim and Summary of Results

The aim of this study was to compare the effects of VM and VSM on the acquisition of EFTPOS purchasing skills of six young adults diagnosed with DS. The overall results indicate that both VM and VSM interventions were effective as they both led to efficient skill acquisition. Visual analysis of the data suggested functional relationships as the dependent variable, percentage of task analysis steps performed correctly, showed pronounced improvements with the introduction of both VM and VSM interventions. These effects were maintained two weeks after the intervention had ceased and in two different community settings; therefore demonstrating the participants' abilities to retain the learnt skills and transfer their learning to novel situations in both VM and VSM conditions.

These results confirm the findings of previous studies that found both VM and VSM to be effective and efficient instructional techniques to teach individuals with IDs social and/or functional skills (Bellini et al., 2007; Buggey, 2012; Burton et al., 2013; Decker & Buggey, 2014; Marcus & Wilder, 2009; Ohtake et al., 2014; Ozkan, 2013; Pierce, 2013; Sherer et al., 2001).

Therefore, overall the results from this study replicate previous research: Using VM and VSM is an effective and rapid treatment for individuals diagnosed with ID's such as DS. Although both intervention modalities were successful, visual analysis of the data from the study indicated individual differences and led to the following conclusions being drawn.

Video Modelling Intervention

The findings from the current study demonstrate that VM was an effective and efficient treatment method for teaching three young adults with DS to use their EFTPOS cards to make purchases. This result supports the Mechling et al., (2003) study which

successfully taught three students with ID to make EFTPOS purchases in community stores

with a computer-based treatment package that included VM. Similar to the Meching et al.

(2003) study, the results of this study indicate individuals with ID can acquire EFTPOS

purchasing skills rapidly and generalize their learnt skills to different community settings

with the support of video modelling technology.

The pronounced skill improvement observed with the introduction of the VM

intervention supports Allen et al.'s (2010) claims as rapid behaviour change occurred which

were later generalized across settings. All participants demonstrated maintenance of their

learnt skills two weeks post-intervention therefore confirming previous research which

identified VM as an effective tool for retention of learnt skills up to 3 months post-

intervention (Allen et al., 2010; Avcioglu, 2013; Haring et al., 1987; Kellems & Morningstar,

2012; Nikopoulos & Keenan, 2003; Nikopoulos & Keenan, 2004; Nikopoulos & Keenan,

2007).

The findings of this study support those of Haring et al. (1987) who found discrete

one-on-one teaching in the classroom paired with VM an effective method for teaching

generalisation of shopping skills to young adults with ASD. Although this study did not use

one-on-one teaching, the VM intervention resulted in generalized EFTPOS purchasing skills

of all participants to two novel community stores. Therefore these results support previous

research identifying VM as an effective means of teaching individuals with ID generalisation

of their learnt skills across settings and peers (Avcioglu, 2013; Nikopoulos & Keenan, 2003;

Nikopoulos & Keenan, 2004; Nikopoulos & Keenan, 2007).

The results of this study also showed an increase in social nuances/skills with the

introduction of the VM intervention. Therefore confirming the findings of Avcioglu, 2013;

Axe & Evans, 2012; MacDonald et al., 2009; Nikopoulos & Keenan, 2003; Nikopoulos &

Keenan, 2004; and Nikopoulos & Keenan, 2007 who found VM to be an effective

intervention modality for teaching individuals with ID social skills. Similar to the results of the Avcioglu (2013) who found VM to be a viable way to teach individuals with ID to approach and greet people, the results of this study indicate that verbal responses to the cashier increased when the VM intervention was introduced (step's 2, 3, 4, and 13b of the task analysis). Similarly, the results of this study supported those of Nikopoulos & Keenan's (2007) who successfully used VM to teach complex social sequences including social initiations and imitative responses to individuals with ASD. Although the social sequences implemented in this study differ from those implemented by Nikopoulos & Keenan (2007), both studies indicate individuals with an ID are able to learn complex social sequences with VM.

Likewise, this study supports the findings of Allen et al., 2010; Biederman et al., 1999; Haring et al., 1987; and Kellems and Morningstar, 2012 who found VM to be an effective instructional technique for teaching individuals diagnosed with ID's functional skills.

Video Self-Modelling Intervention

The findings from this study suggest that VSM is also an effective and efficient intervention technique for teaching young adults with DS to independently use their EFTPOS cards to make purchases in community stores. These findings support previous research that identifies VSM as an effective instructional tool leading to very rapid behaviour change for individuals with ID (Bellini et al., 2007; Burton et al., 2013; Ohtake et al., 2014).

The results of this study support the findings of Bellini et al. (2007); Buggey et al. (2011); Burton et al. (2013); and Ohtake et al. (2014) who found VSM resulted in retention of learnt skills with the individuals with ID once the intervention was withdrawn. Although the studies listed above found positive retention results immediately post-intervention, the

results of this study indicate that VSM can result in retention of learnt skills in young adults with DS for two weeks post-intervention.

The results of this study are also similar to those of Pierce (2013) who found VSM to lead to generalisation of learnt skills. However, Pierce's (2013) results indicated generalisation of learnt skills across therapists, this study resulted in generalisation of skills across settings (supermarket/grocery stores).

The findings from this study are consistent with those of Bellini et al. (2007); Buggey et al. (2011); Ohtake et al. (2014); and Pierce (2013) who found VSM an effective intervention modality for teaching individuals with ID social skills. The results of this study support those of Bellini et al. (2007) who found VSM to be an effective method for teaching individuals with ASD social engagement. Similarly to Bellini et al. (2007), this study found VSM to evoke rapid behaviour change that was maintained when the intervention had been withdrawn. Additionally, the results of this study are consistent with those of Buggey et al. (2011) who found VSM to be a viable means to teach children with ASD social initiation and interaction behaviours and Pierce (2013) who found VSM effective for teaching individuals with ASD various social behaviours including pausing, maintaining eye contact and increasing social initiations. In this study, participants in the VSM condition increased in social engagement with cashier staff when the intervention was implemented.

The results of this study are similar to those of Burton et al. (2013) who found VSM an effective intervention technique for teaching individuals with ID functional skills. Participant's in the Burton et al. (2013) study also successfully learnt purchasing skills however theirs involved estimating the amount of money to pay for a given item and the amount to receive in change. Therefore, the results of this study support previous research that has found VSM to be a viable option for teaching individuals with ID social and functional skills.

Video Modelling & Video Self-Modelling Compared

Overall, the results of this study support the findings of Decker and Buggey (2014), Ozkan (2013), and Sherer et al. (2001) who found both VM and VSM to be equally effective intervention modalities for teaching individuals diagnosed with ID academic, functional, and social skills, respectively. However, the results also support Cihak and Schrader's (2008) results which found VSM to be slightly more efficient with two of their four participants as the VSM condition in this study evoked slightly faster behaviour change however it is difficult to determine whether or not VSM is more efficient based on these results. Furthermore, due to the small sample sizes in both this and the Cihak and Schrader (2008) study, further research needs to be conducted to support these findings. The results of this study differ from Marcus and Wilder's (2009) study that found VSM to be a more superior intervention modality than VM in terms of both effectiveness and efficiency with three children with ASD .

This study's findings are consistent with those of Cihak and Schrader (2008), Decker and Buggey (2014), Ozkan (2013), and Sherer et al. (2001) who found both VM and VSM interventions can lead to retention of the learnt skills after the intervention has been withdrawn as skill acquisition was maintained at the two-week follow-up probe sessions in this study. Similar to this study, Ozkan (2013) and Sherer et al. (2001) also found that both VM and VSM interventions resulted in generalisation of learnt skills across settings, peers, materials, and body parts (first aid) as all participants in this study demonstrated generalisation of learnt skills in two novel community stores.

The results of this study also support Sherer et al. (2001) who found both VM and VSM to be equally effective techniques for teaching individuals with ID to respond appropriately to social questions. Items 3 and 4 of this study's task analysis involved

responding to the cashier's questions (whether or not they had a coupon or FlyBuys and whether they were paying with cash or EFTPOS, respectively), which participants showed marked improvements in during the introduction of both VM and VSM interventions.

Past research postulates the importance of self-efficacy and feelings of competence as motivating factors for learning and performing new skills (Burns & Gunn, 1993; Decker & Buggey, 2014). This current research assists in confirming these suggestions as all participants' confidence, attitudes, and desire for independence appeared to increase considerably throughout, and with the introduction of, the intervention. Decker and Buggey (2014) suggest that viewing positive self and peer videos may enhance one's confidence by providing evidence that successful performance is attainable, enabling considerable progress in their performance. As emphasised by Decker and Buggey (2014) such confidence and self-efficacy is an important factor especially for individuals who are commonly susceptible to learned helplessness.

Anecdotal evidence from parent report supports previous research that suggests viewing VM and VSM videos is highly enjoyable for children with ID and therefore can lead to increased motivation to attend to the video and model performing the desired task (Bellini et al., 2007). As stated previously (Chapter 2) attention given to the desired behaviour/skill is one of the necessary and sufficient conditions of effective modelling procedures (Dowrick, 2012). Parents of participants in both VM and VSM conditions reported their children enjoyed watching their videos which Dowrick (1999) and Bandura (1997) suggest may be due to the depiction of positive behaviours which potentially increased the self-efficacy and attention given by the observer.

This study's results are consistent with Dowrick's (2012, 2012a) emphasis on rapid behaviour change observed with observational learning interventions, especially FF VM and VSM treatments. Participants in both VM and VSM conditions experienced very fast changes

in behaviour with the introduction of the interventions. Therefore supporting Dowrick's self model theory (2012a) as he asserts that individuals are influenced by some but not all behaviour of others in their environment, as the individual must have the prerequisite component skills within their behavioural repertoire for replication to occur. This is also a defining aspect of FF VM/VSM. Dowrick (2012a) also suggests such rapid skill acquisition may also be linked to significant changes in relation to the individuals self-efficacy, expanding Bandura's (1997) suggestion that seeing oneself accurately performing a skills strengthens ones belief in their capabilities as both individuals in the VM *and* VSM condition experienced efficient behaviour change therefore, observing a similar peer perform the desired task may have enhanced the participants' self-efficacy as much as observing oneself performing the desired task.

The importance of model similarity and oneself being the most similar and thus effective model may not be an accurate sole explanation as peer models (VM) were equally as effective as self-models (VSM). However, two of the three peer models shared very similar physical characteristics to the observers in the VM condition (both diagnosed with DS, two of the three yoked pairs were the same gender, and two of the three yoked pairs were the same age) which is dissimilar to some previous research that used typically developing peers, or adults as models in the VM videos rather than models with the same as the observers (Allen et al., 2010; Avcioglu, 2013; Axe & Evans, 2012; Biederman et al., 1999; Cihak & Schrader, 2008; Decker & Buggey, 2014; Haring et al., 1987; Kellems & Morningstar, 2012; MacDonald et al., 2009; Marcus & Wilder, 2009; Nikopoulos & Keenan, 2003; Nikopoulos & Keenan, 2004; Ozkan, 2013; Sherer et a., 2001). Only one other study identified (Nikopoulos & Keenan, 2007) used individuals with disabilities as models for the participants VM video; however the models had learning disability and the observers had ASD . The current study is the only study identified in the literature search (Chapter 2) that

used models with the same diagnosis (DS) as models for the participants' VM videos. Therefore, this study contributes to the literature regarding VM and VM interventions for individuals diagnosed with ID's such as DS.

Conversely, Bandura's (1997) emphasis on the advantage of seeing oneself accurately performing a target skill to enhance ones self-efficacy and beliefs may also hold true as the peer models were so similar to the observers in the VM condition that viewing the models may have also boosted the observers' self-belief, motivation and self-efficacy. Dowrick's (2012a) self model theory propositions including the relevance of mental time travel and mirror neurons may assist in explaining the results of this study as the participants' VM and VSM videos may have helped them to anticipate and plan future EFTPOS purchases (Dowrick, 2012a). Mirror neurons enable an individual to perceive and imitate another individual's behaviour therefore, participants in both conditions were able to view models (peers or self) and later performed similar desired behaviours. However, as Dowrick (2012a) states, further research into mental time travel is required to further support self model theory.

In this study errors made by participants during probe sessions were varied and individualised, as some participants had fine motor difficulties and therefore found swiping their card difficult, whilst others were shy and had more difficulty verbally responding to the cashier's questions or had trouble staying focused on the task at hand and therefore, made sequential errors and skipped steps. Thus, no overall pattern of errors was observed with all participants which is dissimilar to the findings of Ozkan, 2013 who found common sequential or topographical errors demonstrated with the participants in their study.

Similarly to the Ozkan (2013) study, the researcher found creating the VSM videos easier and less time consuming than expected. Although the creation of VM versus VSM videos cannot be compared in this study, as each participant had a VSM created, the

following considerations are outlined. Comparable to Sherer et al. (2001), the components of creating the VSM for each participant were not exhaustive however they included: the participant cooperating with requests from the researcher; obtaining clear video footage of the participant (and/or cashier) performing a task with limited laypersons in the background; and editing the footage to ensure the desired task did not look contrived. All participants were excited and happy to be in the supermarket, to follow the researchers requests and to be filmed. The researcher also found that this intervention method was easily implemented at home and was enjoyed by the participants, as they liked viewing their videos (both VM and VSM videos).

Overall, although participants in the VSM condition displayed slightly more efficient skill acquisition on average, there were no meaningful differences between the results of participants in the VM condition compared with participants in the VSM condition. Furthermore, although participants in the VSM condition began the study with higher performance percentages when scored against the task analysis, this had no apparent impact on proportion learnt as on average participants in the VM condition experienced a 45.68% increase in skill acquisition and participants in the VSM condition experienced a 39.11% increase (table 6). Additionally, participants in the VSM condition reportedly viewed their video more times on average (as shown in table 6) however, it is not known how this may have influenced the efficiency, proportion learnt, retention or generalisation of their skill acquisition.

Social Stories

Anecdotal data recorded by the researcher supports previous research that indicates the potential effectiveness of SS's as tools within intervention packages as both Participant 4 and Participant 6 demonstrated learning occurred as a result of viewing their SS's (Elder,

2002; Barry & Burlew, 2004; Iskander & Rosales, 2013; Matson et al., 2007; More, 2012; Test et al., 2011). More specifically, this study supports emerging research that combines SS's with VM interventions to teach individuals diagnosed with ID's social skills (Kagohara et al., 2013).

Strengths of the Study

As stated previously (Chapter 2) research recommends teaching individuals with ID's skills that enable them to participate independently within their own community (Biederman et al., 1999; Wissick, 1999). Specifically previous research highlights the importance of teaching individuals with ID skills that are; "useful, desirable, practical…acquired in a social context and in the physical context in which it will be ultimately requested" (Burns & Gunn, 1993, p. 17). A strength of this study was that both VM and VSM interventions allowed individuals with DS to learn a highly desirable and useful life skill which will help them function more independently within their communities. Furthermore, with VM and VSM technologies the physical context in which the participants' skills will be requested was realistically simulated (Burns & Gunn, 1993).

A second strength was that unlike significant amounts of previous research with VM and VSM, this study used VM and VSM interventions exclusively without other teaching strategies. This study did not incorporate prompts (verbal, physical, or pictorial), error-correction, reinforcement, one-on-one teaching, or other combined intervention packages as commonly seen in previous research with VM and VSM (Bernad-Ripoll, 2007; Bidwell & Rehfeldt, 2004; Cihak & Schrader, 2008; Haring et al., 1987; Kleeberger & Mirenda, 2010; Murzynski & Bourret, 2007; Rehfeldt, Dahman, Young, Cherry, & Davis, 2003; Shipley-Benamou, Lutzker, & Taubman, 2002). Although the use of additional teaching strategies with VM and VSM has shown to be effective (Bernad-Ripoll, 2007; Bidwell & Rehfeldt,

2004; Cihak & Schrader, 2008; Haring et al., 1987; Kleeberger & Mirenda, 2010; Murzynski & Bourret, 2007; Rehfeldt et al., 2003; Shipley-Benamou et al., 2002), by exclusively utilizing VM and VSM interventions the results of this study can be solely attributed to the effects of VM and VSM interventions therefore extending VM and VSM research as Bellini et al. (2007) emphasise, more research examining the effects of VM and VSM alone is required.

Furthermore, due to current research trends the majority of previous studies examining the effectiveness of VM and VSM interventions with individuals with ID focuses on those with ASD (Allen et al., 2010; Axe & Evans, 2012; Bellini et al., 2007; Buggey, 2012; Buggey et al., 2011; Burton et al., 2013; Cihak & Schrader, 2008; Haring et al., 1987; Kellems & Morningstar, 2012; Marcus & Wilder, 2009; Nikopoulos & Keenan, 2003; Nikopoulos & Keenan, 2004; Nikopoulos & Keenan, 2007; Ohtake et al., 2014; Pierce, 2013; Sherer et al., 2001). Therefore, this study broadens VM and VSM research with individuals with ID to focus on a population of young adults with DS. As mentioned in Chapter 2, individuals with DS share common cognitive, physical and psychological issues that indicate they may require specialized treatments and interventions to acquire certain skills and behaviours. Thus, research focusing on participants with DS is required to increase the evidence base of effective interventions for this population.

As stated previously in Chapter 2, research suggests individuals diagnosed with DS may have a preference for visual rather than verbal instruction (Harper et al., 1994). Therefore due to potentially strong visual learning abilities, observational learning techniques such as VM and VSM may be more effective for this population in comparison to other instructional methods such as one-on-one teaching, or behavioural therapy. Furthermore, as Smith et al. (2014) indicate, both VM and VSM interventions may be beneficial for individuals with disabilities as superfluous and disruptive information can be eliminated and

the most relevant information necessary for learning can be emphasised. Therefore, a strength of this study was that by utilising VM and VSM technologies, the visual learning strengths of the individuals with DS were employed to enhance potential learning opportunities.

A significant strength of this study is the pronounced and rapid improvements many participants made with the introduction of both VM and VSM interventions, thus indicating and replicating functional relationships between the dependent and independent variables. Additionally, two generalisation probes in novel community stores provide support for VM and VSM as effective procedures for evoking generalisation of skills acquisition across settings. Therefore, the results suggest both VM and VSM are effective and efficient procedures for teaching young adults with DS EFTPOS purchasing skills in community stores.

Lastly, a strength of this study is that it extends the research of using VM and VSM procedures to teach individuals with ID to use their EFTPOS cards in community stores. Although Mechling et al. (2003) examined an intervention package which included VM to teach individuals with ID's the specific skill of using their EFTPOS card to complete a transaction on an APM, this study broadened the task analysis to include both pivotal steps required to complete an EFTPOS transaction (i.e., entering their PIN number) and social nuances which are expected by customers in shopping settings. By greeting and responding verbally and appropriately to cashier requests in addition to successfully using their EFTPOS card on the APM to complete a purchase, the participants in this study acquired functional and social skills that may allow them to function more independently within their society and with fewer stigmas.

Limitations

The results of this study should be interpreted with consideration to the following limitations. Firstly, the follow-up data measured in this study was only two weeks post-intervention which is a relatively short period of time therefore no conclusive conclusions can be drawn as to the long term effects of either of the VM and VSM procedures.

A second limitation of the current study is the lack of male representation. As previous research has indicated, DS is slightly skewed towards males (Kovaleva, 2002). Therefore the results from this study are to be applied to males with caution.

Thirdly, although all 6 participants in the current study displayed improvements in skill acquisition, due to unique characteristics of each participant and their individual behavioural improvements, caution is encouraged in regards to generalizing these findings to all young adults with ID such as DS.

Therefore, taking into consideration the above limitations of this study, there are many areas that warrant further exploration and research.

Considerations for Future Research

As no previous studies have examined the exclusive effect of VM or VSM procedures to teach individuals with ID to use EFTPOS cards to complete purchases in community stores, future research could focus on repeating these results with varied participants (varied, ages, genders, and ethnicities) and in varied settings (i.e., supermarkets, department stores, food, entertainment locations, etcetera).

All studies identified (Chapter 2) using VM and/or VSM to teach individuals with ID's social and/or functional skills used single case designs with limited numbers of participants. Therefore, this area would benefit from future research employing randomized

controlled trials of VM and/or VSM to systematically compare the two interventions and to compare the effectiveness of VM and VSM interventions with and without SS's.

During the initial interview many parents indicated that they ideally wanted their children to have a better understanding of money (i.e., not spending more than they have), future research could focus more on this aspect of EFTPOS as it was not clear with this study whether or not the participants concept of money and how it is related to EFTPOS improved with implementation of the VM or VSM intervention. Furthermore, although a SS focused on explaining this concept, a more thorough intervention plan could examine the effects of VM and/or VSM on the understanding of the concepts of EFTPOS with individuals with ID .

Future research may benefit from further examining the difference between models with similar and dissimilar characteristics with VM interventions to assess the importance of model similarity on effectiveness and efficiency of participant's skill acquisition. The models used in the VM condition were almost optimal models in terms of Bandura's (1997) ideals as two of the three yoked participants were matched in terms of diagnosis, age, and sex. Although not as closely matched, the first yoked pair's performance also demonstrated skill acquisition and rapid gains with the introduction of both VM and VSM interventions.

Practical Implications

As stated previously, VM and VSM procedures can be effective and efficient procedures for teaching individuals with ID functional and/or social skills. Due to advances in technologies creating VM or VSM videos is not difficult or time-consuming, they are easily implemented as individuals can view their videos anywhere with video technology, individuals may enjoy viewing VM and VSM videos therefore are likely to attend to their video and want to watch it, and both VM and VSM can result in very rapid behaviour changes. Therefore VM and VSM procedures may be highly useful for educators and

clinicians working with young adults with ID such as DS and for whom functional and social skills need to be explicitly taught. For educators or clinicians that are unable to create VSM videos of the clients (i.e., due to compliancy issues. limited ability to capture the desired behaviour/skill in the natural environment or on camera, or physical, cognitive, or psychological constraints), the results of this study indicate that VM is an alternative option that can be equally effective.

However, a significant practical implication to for educators and clinicians to be aware of is the difficulty parents of some participants in this study faced when attempting to get EFTPOS cards from the bank for their children. Although all participants eventually did receive EFTPOS cards from their various banks, parents were persistent and were required to attend meetings and provide sufficient information to attain these.

Conclusions

The results of this study indicate that using VM or VSM to teach independent EFTPOS purchasing skills to young adults with Down syndrome are equally effective and efficient strategies that lead to retention, generalisation and rapid learning of skills. The characteristics of VM and VSM match well with typical strengths and weaknesses experienced by individuals with Down syndrome and provide an enjoyable and nonintrusive teaching strategy. All 6 participants' independence and confidence in the community supermarket increased during the intervention phase and five of the 6 participants met criterion and were able to consistently use their EFTPOS cards to purchase their chosen items in the allocated local supermarket and two novel community stores (another local supermarket chain and a Dairy) two weeks post-intervention. There is a need to identify evidence-based practices for individuals with ID such as DS to provide them with the skills necessary to actively and independently function within their community. This study

indicates that both VM and VSM show promise as effective and efficient treatments for addressing the functional and social skills of individuals diagnosed with DS.

CHAPTER 6: References

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Telephone: 022 412 2350 (Kate Danna)

03 345 8153 (Lawrence Walker)

Email: kad71@uclive.ac.nz
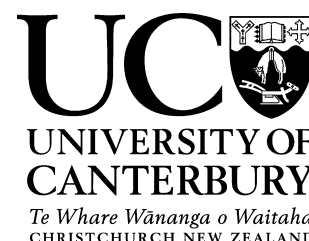
Using Video Modelling and Video Self-Modelling to teach a group of young adults with Intellectual Disabilities to make point of sale electronic transactions

Information Sheet for Parents/Caregivers

My name is Kate Danna, and I am doing a project at the University of Canterbury to try and help people with intellectual disabilities learn the skills of using an EFTPOS card to buy things. I am wanting to find out which of two video teaching techniques works the best.

I would like to invite your son/daughter to be a participant in my study.

What this means is that:

- You and your son/daughter having consented will attend an introductory interview with myself at a mutually agreed time and place to ensure the project is suitable for your son/daughter.
-
- You will limit the total monetary amount available to your son/daughters chequing account to a mutually agreed amount (i.e., minimum $40 to help them learn what funds are available for purchases).
-
- Items which are allowed to be purchased by your son/daughter, and the limit on purchases, will be discussed and mutually agreed (with you, your son/daughter, and myself) prior to the commencement of the study.
-
- Your son/daughters involvement in this project will involve meeting me at a mutually agreed place and time to teach them the skills of safely and independently using their EFTPOS card to purchase items.
-
- I will teach your son/daughter coping skills to help them manage unexpected situations (i.e., their EFTPOS card declining).
-
- I will teach your son/daughter secrecy skills to help them understand the importance of not sharing personal information with others (i.e., PIN numbers).
-
- Your son/daughter will be videoed using an EFTPOS card and they will watch this video, they will also watch someone else's video and someone else (another participant) will watch theirs. This is how I will show your son/daughter the skills they need.

-
- Your son/daughter will have some photos taken of them which I will use in a series of visual prompts to explain and help them understand the concept of the electronic banking system, a personalised story about banking.
-
- Your son/daughter will practice with me, before using their EFTPOS card in a real world setting (i.e., supermarket).
-
- Your son/daughter will have any choice of stores should they find the one they are using uncomfortable.
-
- I will send you a summary of the results from the project.

Participation is voluntary and your son/daughter has the right to withdraw at any stage without penalty. If your son/daughter does withdraw, I will remove information relating to them to the extent that this is feasible.

The results of the project may be published, but you may be assured of the complete confidentiality of data gathered in this project: your son/daughter's identity will not be made public without prior consent from yourself and your son/daughter. To ensure anonymity and confidentiality, a code name will be assigned to your son/daughter, so they are not identifiable. Data will be securely stored in a locked filing cabinet at the University of Canterbury and on Kate's computer in a file with password access only. Only Kate, her supervisors, and an assistant will have access to this cabinet. The data will be destroyed after five years. A thesis is a public document and will be available through the University of Canterbury library.

The project is being carried out as a requirement for a Master of Arts in Child and Family Psychology by Kate Danna under the supervision of Lawrence Walker, who can be contacted at lawrence.walker@canterbury.ac.nz (03 345 8153), and Karyn France, who can be contacted at karyn.france@canterbury.ac.nz (03 364-2610). They will be pleased to discuss any concerns you may have about participation in the project.

This project has been reviewed and approved by the University of Canterbury Human Ethics Committee, and participants should address any complaints to The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

If your son/daughter agrees to participate in the study, please ensure you complete the attached permission slip and your son/daughter completes the attached consent form and post it to Kate in the attached confidential envelope by (FRIDAY 4TH JULY)

Yours Sincerely,

Kate Danna

Telephone: 022 412 2350 (Kate Danna)

03 345 8153 (Lawrence Walker)

Email: kad71@uclive.ac.nz

lawrence.walker@canterbury.ac.nz

UC
UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND
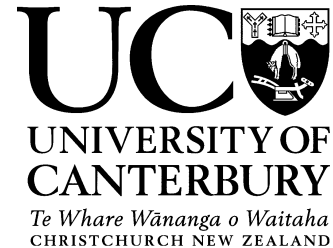
Using Video Modelling and Video Self-Modelling to teach a group of young adults with Intellectual Disabilities to make point of sales electronic transactions

CONSENT FORM FOR PARENTS/CAREGIVERS

☐ Kate has told me about the project and answered my questions about it.

☐ I understand that an introductory interview including myself, my son/daughter, and Kate will be held at a mutually agreed time and place and will be voice recorded.

☐ I understand that I will limit the monetary amount available in my son/daughters chequing account to a mutually agreed amount.

☐ I understand that I will discuss and mutually agree (with Kate and my son/daughter) on items which my son/daughter can purchase and a limit on purchases prior to the commencement of the study.

☐ I understand Kate will teach my son/daughter coping skills so they are able to deal with related unexpected events (i.e., their EFTPOS card declining).

☐ I understand that Kate will teach my son/daughter secrecy skills to teach them not share personal information (i.e., their PIN number).

☐ I understand that Kate will organise training sessions in a mutually agreed time and place.

☐ I understand my son/daughter will have any choice of stores should they find the one they are using uncomfortable.

☐ I understand that it is my son/daughters choice to be part of the project and that they may pull out at any stage.

☐ I understand that my son/daughter will be videotaped during the project, and another participant will view this video.

☐ I understand that my son/daughter will be photographed and will then view these photos to help them understand the concept of EFTPOS.

☐ I understand that all information about my son/daughter will be kept confidential to the researcher, and that personally identifiable information (i.e., their name and location) will not be used in any published or reported results.

☐ I understand that all the information collected for this project will be kept in locked and secure facilities at the University of Canterbury, and in password protected electronic form and will be destroyed after five years, except videos which will be destroyed after the study is complete.

☐ I agree to the results of this project being published and/or presented at a conference, and understand that a thesis is a public document and will be available through the University of Canterbury library.

☐ I understand that I will receive a summary of the findings of the study if I want them.

☐ I understand that if I require further information I can contact Kate, or her Supervisor Lawrence Walker (lawrence.walker@canterbury.ac.nz, +64 3 345 8153

☐ I note that this project has been reviewed and approved by the University of Canterbury Human Ethics Committee.

☐ I understand that if I have any complaints, I can contact the Chair of the University of Canterbury Human Ethics Committee at the following address: Private Bag 4800, Christchurch (human- ethics@canterbury.ac.nz).

By ticking the above boxes and signing below, I am saying that I understand the project and I am agreeing for my son/daughter to be part of it.

Name: _____

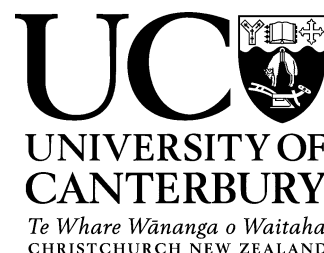Date: _____

Signature: _____

Phone Number: _____

Email Address: _____

_____

Please put this form in the attached confidential envelope and post it back to Kate by (FRIDAY 4TH JULY)

Telephone: 022 412 2350 (Kate Danna)
          03 345 8153 (Lawrence Walker)

Email: kad71@uclive.ac.nz
lawrence.walker@canterbury.ac.nz

Using Video Modelling and Video Self-Modelling to teach a group of young adults with Intellectual Disabilities to make point of sales electronic transactions

INFORMATION SHEET FOR PARTICIPANTS

My name is Kate Danna, and I am doing a project at the University to try and help people with Intellectual Disabilities learn the skills of using an EFTPOS card to buy things. I am wanting to find out which of two video teaching lessons works the best.
I would like to invite you to be a participant in my study.

What this means is that:
You and your parents/caregivers will need to give me your permission by reading and signing this form so I can talk with you.

You and your parents/caregivers will have an interview with me to see if the project is suitable for you.

You, your parents/caregivers and Kate will talk about and decide which items in a shop you can purchase and a limit on purchases before we start the study so that you know what you can buy and how much money you can spend at the shop.
I will meet with you somewhere which suits you and your parents/caregivers and I will teach you the skills of safely and independently using an EFTPOS card to buy things.

You will be videoed using an EFTPOS card and you will watch this video. This is how I will show you the skills you need. You will also watch another student's video and they will watch yours.

You will have some photos taken, I will use these photos to help you understand how EFTPOS cards work.

We will practice using an EFTPOS card a few times before we go to a shop to buy anything.

You will be videoed using your EFTPOS card in the shop so that I can see how well you do.

You will receive a short message (i.e., text message or email) each day to remind you to watch the video.
You will be able to choose another store to use if you find the one you are using feels uncomfortable to you.

You and my two supervisors, research assistant, one other student, and I will see the videos. They will be locked away so they are safe. I will give you a copy too and I will destroy my copies after the project is finished.

Taking part in this project is voluntary and you can leave at anytime if you want without penalty. The results of this project may be published or talked about at a conference, and my write up (thesis) will be publically available through the University of Canterbury library. You will be given a made-up name when I write up the project so no one will know your real name, your identity will not be made public without prior consent from yourself and your parent/s. Data from the project will be securely stored in a locked filing cabinet at the University of Canterbury and on Kate's computer in a file with password access, only Kate, her supervisors, and assistant will have access to the filing cabinet and computer files. I will send you a summary of what I found out from the project.

If you have any questions about the study, please contact me (details above) or my senior supervisor Lawrence Walker (details above). If at any time you are unhappy about the project you or your parents can contact the Chair of the University of Canterbury Humans Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch, Email: human-ethics@canterbury.ac.nz
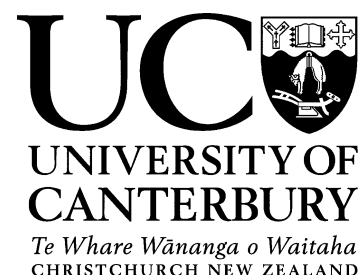
If you would like to take part in this project, please fill out the attached CONSENT FORM on the next page and post it to me in the attached confidential envelope by (*FRIDAY 4TH JULY*).

Yours sincerely,
Kate Danna

APPENDIX D

Telephone: 022 412 2350 (Kate Danna)
             03 345 8153 (Lawrence Walker)

Email: kad71@uclive.ac.nz
lawrence.walker@canterbury.ac.nz

Using Video Modelling and Video Self-Modelling to teach a group of young adults with Intellectual Disabilities to make point of sales electronic transactions

CONSENT FORM FOR PARTICIPANTS

☐ Kate has told me about the project and answered my questions about it.

☐ I understand that I my parents/caregivers will be interviewed by Kate and that I will also be there at this interview.

☐ I understand that I will be interviewed by Kate and that my parents/caregivers will be there at this interview.

☐ I understand that it is my choice to be part of the project and that I may pull out at any stage.

☐ I understand that Kate will organise training sessions in a store at a time that suits us both.

☐ I understand that I will talk with my parents/caregivers and Kate before the study starts to agree on what things I can buy at the shop and how much I can spend.

☐ I understand that I will be buying items in a store as a customer and agree to follow the stores rules.

☐ I understand that I will be videotaped during the project, and I agree to this.

☐ I understand I will get short messaged every day (i.e., texts or emails) to remind me to watch my video.

☐ I understand that I will have some photos taken of me, and I agree to this.

☐ I understand that I will be able to choose another store if I find the one I am using uncomfortable.

☐ I understand that all information about me will be kept a secret and that my real name will not be used in the write up or publications.

☐ I understand that all the information collected for this project will be kept safe and locked at the University of Canterbury and in password protected electronic form and will be destroyed after five years, except the researcher's copies of the videos which will be destroyed as soon as the project is finished.

☐ I agree to the results of this project being published and/or talked about at a conference and understand that the thesis (write up) will be publically available through the University of Canterbury's library.

☐ I understand that I will receive a summary of the findings of the study.

☐ I understand that if I require further information I can contact Kate, or her Supervisor Lawrence Walker (details above).

☐ I note that this project has been reviewed and approved by the University of Canterbury Human Ethics Committee.

☐ I understand that if I have any complaints I can tell my parents/caregiver and they can contact the Chair of the University of Canterbury Human Ethics Committee (human-ethics@canterbury.ac.nz).

By ticking the above boxes and signing below, I am saying that I understand the project and I am agreeing to be part of it.

Name: _____
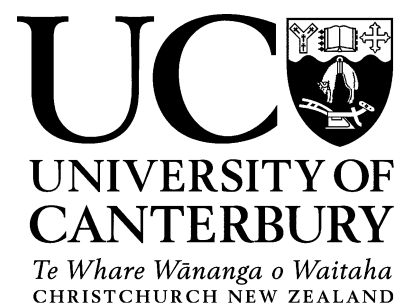Date: _____
Signature: _____
Phone Number: _____
Email Address: _____

_____

Please put this form in the attached confidential envelope and post it back to Kate by (FRIDAY 4TH JULY).

Telephone: +64 22 412 2350 (Kate Danna)
             +64 3 345 8153 (Lawrence Walker)

Email: kad71@uclive.ac.nz
lawrence.walker@canterbury.ac.nz

Using Video Modelling and Video Self-Modelling to teach a group of young adults with Intellectual Disabilities to make point of sales electronic transactions

INFORMATION SHEET FOR STORE PERSONS

My name is Kate Danna, I am a student at the University of Canterbury undertaking my thesis for my Master of Arts, and I will be studying the effects of Video Modelling and Video Self-Modelling on teaching electronic point of sale transaction skills to young adults with Intellectual Disabilities in a store setting.

I am seeking your permission to video tape a member of your staff assisting my participants in my project in your store.

Your staff member will be videotaped while he/she performs the tasks of completing an electronic transaction with the participant. This will take place at a check-out in your store at a mutually agreed time. This video will then become the training video for the participants and they will retain a personal copy.

Your staff member will only feature in the video modelling training video. He/she will not be named at any point in the training video or the project write up and will be referred to as 'the shop assistant' in my write up. An acknowledgement of the store's support can be mentioned in the thesis if desired.

You can withdraw from the project at any time. The results of this project may be published, but you may be assured of the complete confidentiality of data gathered in this investigation: your stores and your volunteer staff members identity will not be made public without prior consent from yourself and your volunteer staff member. A thesis is a public document and will be available through the University of Canterbury library. Data will be securely stored in a locked filing cabinet at the University of Canterbury and on the researchers computer in a file with password access only. Only the researcher, supervisors, and researchers assistant will have access to this cabinet and computer files. The data will be destroyed after five years. The training video that your staff member features in will only be seen by the participants, researcher, supervisors, and research assistant. The video will be destroyed after five years.

If at any time you are unhappy about the project you can contact the Chair of the Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch, Email: human-ethics@canterbury.ac.nz
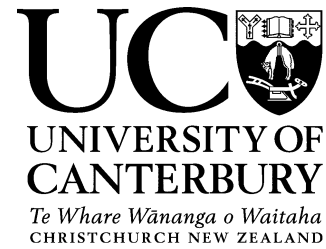
If you would like to be part of this project please sign the CONSENT FORM on the next page and post it to me in the attached envelope by (FRIDAY 4TH JULY).

Yours sincerely,

Kate Danna

APPENDIX F

Telephone: 022 412 2350 (Kate Danna)
                 03 345 8153 (Lawrence Walker)
Email: kad71@uclive.ac.nz
lawrence.walker@canterbury.ac.nz

Using Video Modelling and Video Self-Modelling to teach a group of young adults with Intellectual Disabilities to make point of sales electronic transactions

CONSENT FORM FOR STORE PERSONS

☐ I understand the project, and my role in it.
☐ I am happy to be a part of the project as a volunteer.
☐ I understand that this store will be included in the training videos that the participants view to learn EFTPOS purchasing skills.
☐ I understand that a member of staff will feature in the video, and they will only be referred to as the shop assistant.
☐ I understand that only the participants, supervisors, researcher, and researchers assistant involved in the project will see the video.
☐ I understand that the store's name will not be used in the project at any time; however, acknowledgment of the store's support in the final thesis can be arranged.
☐ I understand that I can change my mind about the store being in this project at any time.
☐ I understand that the results of this project may be published and will be publically available through the University of Canterbury library using pseudonyms.
☐ I understand that all data collected for the study will be kept in locked and secure facilities at the University of Canterbury and in password protected electronic form and will be destroyed after five years.
☐ I understand that the video will be destroyed after the project is complete; however, the participants are responsible for their copies of the video.
☐ I know that if I have any questions I can ask Kate or her supervisor Lawrence Walker.
☐ If I have any complaints, I can contact the Chair of the University of Canterbury Human Ethics Committee, Private Bag 4800, Christchurch (human- ethics@canterbury.ac.nz).
By ticking the above boxes and signing below, I am indicating I understand the research and I am agreeing to participate.

Name: _____

Position: _____

Date: _____

Signature: _____

Please post this consent form back to me in the attached confidential envelope by (FRIDAY 4TH JULY).

Telephone: 022 412 2350 (Kate Danna)
　　　　　　03 345 8153 (Lawrence Walker)

Email: kad71@uclive.ac.nz
lawrence.walker@canterbury.ac.nz

Using Video Modelling and Video Self-Modelling to teach a group of young adults with Intellectual Disabilities to make point of sales electronic transactions

INFORMATION SHEET FOR SHOP ASSISTANT VOLUNTEERS

My name is Kate Danna, I am a student at the University of Canterbury undertaking my thesis for my Master of Arts, and I will be studying the effects of Video Modelling and Video Self-Modelling on teaching electronic point of sale transaction skills to young adults with intellectual disabilities in a store setting.

I am seeking your permission to video tape you while you assist with my project.

You will be videotaped while you perform the tasks of completing an electronic transaction with an individual with intellectual disability. This video will then become the training video for the participants and will be viewed by the student you are filmed with and one other student in the same situation.

This will take longer than a usual transaction because some if it may need to be repeated. You will only feature in the video modelling training videos. You will not be named at any point in the training video or the project write up and will be referred to as 'the shop assistant' in my write up.

You can withdraw from the project at any time. The results of this project may be published, but be assured of the complete confidentiality of data gathered in this investigation: your identity will not be made public without prior consent from yourself. A thesis is a public document and will be available through the University of Canterbury library. Data will be securely stored in a locked filing cabinet at the University of Canterbury and on the researchers computer in a file with password access only. Only the researcher, supervisors, and researchers assistant will have access to this cabinet and computer files. The data will be destroyed after five years. The training video that you feature in will only be seen by the two participants, researcher, supervisors, and research assistant. The video will be destroyed after the completion of my project; however, a copy will be given to the participants.

If at any time you are unhappy about the project you or your parents can contact the Chair of the Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch, Email: human-ethics@canterbury.ac.nz

If you would like to be part of this project please sign the CONSENT FORM on the next page and post it to me in the attached confidential envelope by (FRIDAY 4TH JULY).

Yours sincerely,

Kate Danna

APPENDIX H

Telephone: 022 412 2350 (Kate Danna)
             03 345 8153 (Lawrence Walker)

Email: kad71@uclive.ac.nz
lawrence.walker@canterbury.ac.nz

Using Video Modelling and Video Self-Modelling to teach a group of young adults with Intellectual Disabilities to make point of sales electronic transactions

CONSENT FORM FOR SHOP ASSISTANT VOLUNTEERS

☐ I understand the project, and my role in it.
☐ I am happy to be a part of the project as a volunteer.
☐ I understand that I will be included in the training videos that the participants view to learn purchasing skills.
☐ I understand that only the participants, supervisors, researcher, and researchers assistant involved in the project will see the video. I also understand that a copy of the video will given to the participants.
☐ I understand that my real name will not be used in the project at any time.
☐ I understand that I can change my mind about being in this project and no-one will mind.
☐ I understand that the results of this project may be published and will be made publically available through the University of Canterbury library, using pseudonyms.
☐ I understand that all data collected for the study will be kept in locked and secure facilities at the University of Canterbury and in password protected electronic form and will be destroyed after five years.
☐ I understand that the video will be destroyed after the research is finished, however the participants will be responsible for what happens to their copy.
☐ I know that if I have any questions I can ask Kate or her supervisor Lawrence.
☐ If I have any complaints, I can contact the Chair of the University of Canterbury Human Ethics Committee, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

By ticking the above boxes and signing below, I am indicating I understand the research and I am agreeing to participate.

Name: _____

Position: _____

Date: _____

Signature: _____

Please post this consent form back to me in the attached confidential envelope by (FRIDAY 4TH JULY).

Semi-structured Interview Schedule

Date: Time: Setting: Interviewee:

Parent/Caregiver Questions

Q1.   Does your son/daughter have a way on contacting you? What is this (so I can contact

you in case of emergency)?

Number: _____

Q2. How does your child shop now? Any processes they already have in place?

Q3. Can you tell me about a typical shopping experience with your child?

Q4. What do you hope your child to get out of this? (discuss any misdirected perceptions).

Q5. What are your concerns for your child participating in this project/having the skills to

use an EFTPOS card independently?

Q6. Is there anything you think I should be aware of, especially regarding health and safety?

Q7. Have you talked about or taught your child a way of coping with the unexpected (i.e.,

what to do if their card doesn't work)?

      Q7 a. If yes, tell us what it was/is…

      Q7 b. Has your child ever had to use that strategy?

If yes, how does your child react? (passive, aggressive, becomes uncontrollable. What

strategies have you found effective in coping with this?

Participant **and Parent/Caregiver Questions**

Participant Name:

Participant Age:

Participant Sex:

Able to speak and understand conversational English: Y/N

Able to participate in conversation: Y/N

Q1. Would you like to learn how to use an EFTPOS card to buy things?

Q2. What do you do when you go to the shop now?

Q3. How do you feel when you are at the shop and you are buying things?

Q4. How would you feel if you had to buy things at the shop now on your own?

Q5. How would you feel if you had to buy things at the shop with an EFTPOS card on your own now?

Q6. Can you type on a computer/keyboard (ensure agreement between parent/caregiver and participant, if still unsure, ask the participant to demonstrate the skill).

Q7. Can you read? (ask the participant to read words: Chq ; savings; credit; accepted; declined; please; thank you; enter; your; pin; number; okay; cancel)

Q8. Can you count to 10? (ask the participant to demonstrate this)

Q9. Can you recognize numbers? (ask the participant to tell you what number the following are: 1, 9, 6, 0, 8, 3, 7, 5, 2, 4) (show keypad and ask child to identify the number e.g. show me 7).

Q10. Can you remember numbers (tell the participant a four digit sequence and see if they can remember it: 6, 3, 9,1. 7,4,2,8)

Q11. Do you know which number is bigger, 1 or 9?, 7 or 4?, 2 or 6?

Q12. Which number is smaller, 3 or 5?, 8 or 1?, 4 or 6?

Observation Schedule

Date: Session Time: Setting: Student:

No.	Event	Correct Response (within 10 seconds)	Incorrect Response
1	**Put items on Check Out counter**		
2	Cashier greeting and scans items. Respond **'Hello'** or similar.		
3	Cashier – 'That's $?.??, do you have a coupon or FlyBuys?", Respond, **"No thank you", or "Yes please" if FlyBuys present.** Cashier – "Cash or EFTPOS?"		
4	**State, "EFTPOS please"**		
5	**Wait** for instruction on APM: 'SWIPE OR INSERT CARD', if necessary ask Cashier for help, "can you help me with my ETPOS card please?"		
6	**Swipe card, or insert card, or pass cashier card**		
7	**Wait** for APM instruction: 'ACCOUNT $?.?? CHQ SAV CRED'		
8	**Select account: 'CHQ'**		
9	**Wait** for APM instruction: 'CHQ PIN?'		
10	**Select Pin, ensure there are four *'s**		
11	**Select 'ENTER', the green button**		

12	**Wait** for APM response.		
13	**'Accepted'** Cashier 'Would you like your receipt?' Respond: **'Yes please' & take receipt** or **"No thank you" and don't take receipt.**		132
14	**Take goods/Leave store with goods.**		
13a	**Wait for APM response** **'Declined'**		
14a	Ask the cashier – **"Can I try again please"**		
15a	**Swipe card, or insert card, or pass cashier** **card**		
16a	**Wait** for APM instruction: ACCOUNT $?.?? CHQ SAV CRED'.		
17a	**Select account: 'CHQ'**		
18a	**Wait** for APM instruction: 'CHQ PIN?'		
19a	**Select Pin, ensure there are four ***		
20a	**Select 'ENTER', the green button**		
21a	**Wait** for APM response		
22a	**'Accepted'** Cashier 'Would you like your receipt?' Respond: **'Yes please' & take receipt.**		
23a	**Leave store with goods**.		
22b	**Wait** for APM response 'Declined'		
23b	Thank the cashier and leave the store WITH- OUT goods – **"Thank you, but I need to go** **and talk to my bank".**		

APPENDIX L

…'s Viewing Record						
	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	**Sunday**
WEEK 1							
WEEK 2							

✓ **Put a tick for every time you watch your video about using your EFTPOS card**

APPENDIX M

Social Story 1

Sally's EFTPOS Card

Page 1:   "Sally's EFTPOS Card"
(Picture of Participant's EFTPOS card)

Page 2:   "When Sally goes to the shop she takes her EFTPOS card with her"
(Picture of Participant holding their EFPOS card)

Page 3:   "At the shop Sally chooses her groceries and takes them to the check-out"
(Picture of Participant choosing their groceries)

Page 4:   "Sally uses her EFTPOS card to buy her groceries"
(Picture of participant using their EFTPOS card on the APM)

Page 5:   The amount Sally's groceries cost goes from Sally's bank account to the shop's.
(Picture of cash money going from the participant's EFTPOS card to the supermarket)

Page 6:   Sally then has less money in her bank account but has her groceries.
(Picture of participant walking out of the supermarket with a bag of groceries)

Social Story 2

My Secret Number

Page 1: "My Secret Number"
(Picture of ****)

Page 2: "Sally's EFTPOS card has a secret number called a PIN number"
(Picture of APM with **** on the screen)

Page 3: "Sally tries hard to remember her EFTPOS cards secret number, but if she forgets she can ask her Mum or Dad"
(Picture of participant with their Mum and Dad, or whoever knows their *EFTPOS card's PIN number)*

Page 4: "Only Sally, Sally's Mum, and Sally's Dad know what her EFTPOS cards secret number is"
(Picture of participant with their Mum and Dad, or whoever knows their EFTPOS card's PIN number)

Page 5: "Sally tries not to tell anyone else her EFTPOS card's secret number"
(Picture of participant with their finger over the mouth making a "Ssh" sign).

Page 6: "Sally doesn't tell her friends her EFTPOS cards secret number, even if they have no money"
(Picture of participant with their friend/s)

Page 7: "Sally doesn't tell the shopkeeper her EFTPOS cards secret number, even if they are trying to help her"
(Picture of the participant and a cashier)

Page 8: "Only Sally, Sally's Mum, and Sally's Dad are allowed to know her EFTPOS cards secret number"
(Picture of participant with their Mum and Dad, or whoever knows their EFTPOS card's PIN number)

Social Story 3

Unexpected Events At the Shop

Page 1:   "Unexpected Events at the Shop"
(Picture of a cartoon shop)

Page 2:   "Sometimes at the Supermarket unexpected things happen"
(Picture of colourful question marks)

Page 3:   "Sometimes people make mistakes entering their secret number. When this happens the machine will show "INCORRECT PIN""
(Picture of the APM displaying "INCORRECT PIN")

Page 4:   When Sally is at the shop and the EFTPOS machine says "INCORRECT PIN" Sally can try again once. She might say, "Can I try again please"
(Picture of the APM displaying "INCORRECT PIN")

Page 5:   "Sometimes people try to use their EFTPOS card to buy things that cost more money than they have. When this happens the EFTPOS machine will show *"DECLINED""*
(Picture of the APM displaying "DECLINED")

Page 6:   "When Sally is at the shop and the EFTPOS machine says *"DECLINED"* Sally can try again once. She might say, "Can I try again please""
(Picture of the APM displaying "DECLINED")

Page 7:   "If the EFTPOS machine shows *"DECLINED"* again Sally might say, "Sorry, my card has declined again, I'll have to come back later". Sally leaves the shop without the items she wanted to buy"
(Picture of the APM displaying "DECLINED")

Page 8:   "Sometimes people accidentally use the wrong card on the EFTPOS machine. When this happens the machine may say *"Invalid Card""*
(Picture of the APM displaying "INVALID CARD")

Page 9:   "When this happens Sally can say "Oops I used the wrong card, let me try my EFTPOS card". Then Sally can have another try, this time using her EFTPOS card"
(Picture of voucher's and rewards cards)

Page 10:   "Sometimes people press the wrong account on the EFTPOS machine. When this happens the EFTPOS machine will show, *"ACCOUNT ERROR""*
(Picture of the APM displaying "ACCOUNT ERROR")

Page 11:   "When the EFTPOS machine says *"ACCOUNT ERROR"* Sally can say to the shop person, 'Can I try again please', and have another go at using her EFTPOS card"

(Picture of the APM displaying "ACCOUNT ERROR")

Page 12: "There are lots of unexpected things that can happen at the shop. Usually, the shop person will help by saying what is happening. It is important to listen to the shop person"
(Picture of the participant and a cashier looking at each other and smiling)

Social Story Comprehension Questions

<u>Social story 1 "…'s EFTPOS card"</u>
Circle the right choice

1. What does … take when she goes shopping?

A.   Her EFTPOS card?
B.   Her swimming togs?
C.   Her school book?

2. What happens to …'s money when she buys something from the shop?

A.   Money goes from her bank to the shops bank.
B.   Nothing.
C.   Money goes from the shop to Georgia's bank.

<u>Social story 2 "My Secret Number"</u>

1. Can I tell Mum my EFTPOS cards secret number?

2. Can I tell the shopkeeper my EFTPOS cards secret number?

3. Can I tell Dad my EFTPOS cards secret number?

4. Can I tell my friends my EFTPOS cards secret number?

Social story 3 "My Coping Strategy"

1. When the EFTPOS machine shows 'INVALID CARD' can I try my EFTPOS card?

YES **NO**

2. When the EFTPOS machine shows 'DECLINED' can I try more than two times?

NO **YES**

3. If the EFTPOS machine shows 'INCORRECT PIN' twice can I take my groceries home?

YES **NO**

4. If the EFTPOS machine shows 'INCORRECT ACCOUNT' do I leave the shop with my groceries?

NO **YES**