Effects of Video Modelling on Social Skills among Newly Employed Adults with Autism Spectrum Disorder and Intellectual Disability

A thesis

submitted in partial fulfilment

of the requirements for the degree

of

Masters in Applied Psychology (Applied Behaviour Analysis) in Faculty of Arts and Social Sciences

at

The University of Waikato

by

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THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

2020

Acknowledgement

I would like to thank my supervisor Assoc. Prof. Angelika Anderson for her consistent support and guidance in facilitating me though this study. I am also indebted to her for sharing her experties in this field.

I wish to also express my sincere gratitude to Dr. Gregory Jacobson for his support and his time to help me when I needed it. I am also extremely thankful of my father, Ir. Seng Lee Jot, for his time and unconditional help and encouragement.

I would also like to thank my family, especially my mother, for their unconditional support to ensure that I run this study smoothly. Furthermore, I would also like to thank my participants for their participation and the organisation for making this study possible.

Lastly, I am also grateful for my friends, my colleagues, my clients and my line manager for their constant encouragement and support through this venture.

Abstract

One of the main challenges for individuals with Autism Spectrum Disorder and Intellectual Disability in seeking and securing employment is their social skills. While many studies have investigated different methods to enhance their social skills, there is limited research on the usage of Video Modelling as social skills intervention for this group. This study investigated the effect of Video Modelling for individuals with Autism Spectrum Disorder and Intellectual Disability on social behaviours in an employment setting. Results show that there was an immediate increase in target behaviours when video modelling was used. However, improvements in the target behaviour were not maintained. Due to multiple limitations, results for this study are inconclusive, but it is worthy to further investigate video modelling as an intervention for social skills in future studies.

Keywords: Video Modelling, Autism Spectrum Disorder, Intellectual Disability, Employment, Social Skills

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Chapter 1:
Background of Study

As one enters adulthood, it is common to seek employment. However, individuals with Autism Spectrum Disorder and Intellectual Disabilities face many challenges in doing so. Among these challenges, a lack of social skills, which is an important skill in seeking and maintaining employment, seems to be a main barrier for the group (Chen, Leader, Sung, & Leahy, 2014; C. A. Payne, 2015; Sperry & Mesibov, 2005) therefore, studies on interventions that help enhance this aspect would be beneficial to society.

The Institute of Medicine (2007) published a report stating that "designing technologies today for an accessible tomorrow should be a national priority" (p.184). Since the usage of electronic technology is nowadays commonplace, it would be convenient to utilise such easily accessible technologies. Interventions that utilises technologies allow individuals to be more independent (Agree, 2014) and their flexibility means interventions can be personalised to cater for different people with different needs. This electronic era has opened up a world of possibilities in investigating and implementing a diverse set of interventions, including video-based interventions (VBI). The purpose of this study was to investigate the usage of video-based interventions, primarily video modelling, and the effect of these interventions on social skills of individuals with ASD and ID in the context of employment.

Benefits of Employment Among the Disabled Community

There are many benefits to employment. Employment status of an individual is said to have an influence over an individual's psychological well-being. While there are many factors that would influence an individual's level of happiness while being employed (such as job satisfaction), unemployment on the other hand, decreases an individual's wellbeing and

happiness (Ohtake, 2012) and individuals who are unemployed reported to have lower life satisfaction (Carroll, 2007).

A number of studies have also shown that there is a correlation between employment and an individual's mental health (Dooley, Fielding, & Levi, 1996; Modini et al., 2016; Ronald C. Kessler, 1989). Not only is it good for an individual's mental health (Modini et al., 2016), according to William Baumol, it is also good for the country's economy (as cited in Capozzi, 2019).

A company can benefit in different aspects through hiring employees with disabilities. A systematic review by Lindsay, Cagliostro, Albarico, Mortaji, and Karon (2018) concluded that employing disabled employees can: reflect positively on the companies' profitability, give them an advantage in the cooperate world, and contribute towards having an inclusive work culture through awareness of different employee's abilities. The increase of a company's profitability can result from the employees' loyalty to their employers, who have invested in them by training and hiring them, and by increased productively through the employee feeling more accomplished and satisfied in their workplace (Kalargyrou, 2014).

Besides that, employees with disabilities are also reportedly more reliable and punctual and this is also good for a company's external image. This would also increase a company's productivity (Lindsay et al., 2018).

Employment Among the Disabled Community

Unfortunately, individuals with a disability are half as likely to be hired as non-disabled individuals, and their average weekly income is just over half of that of their non-disabled peers (Stats NZ, 2017a). However, when comparing types of disabilities, such as mental and physical disabilities, individuals with a history of mental disability are less likely to be hired

compared to those who have a physical disability, despite having the same qualification (Drehmer & Bordieri, 1985). Furthermore, individuals with ID are reported to be 3-4 times less likely to be employed compared to those without a disability (Holwerda, van der Klink, de Boer, Groothoff, & Brouwer, 2013).

There are several reasons why employers are less likely to hire individuals with a disability. In a study by Stephen Kaye, Jans, and Jones (2011), it was revealed that the reasons for employers not wanting to hire and retain employees with a disability are mainly due to the employers' lack of knowledge on how to work with and accommodate individuals with a disability. Some of their concerns surround: the cost incurred to accommodate disabled employees to do their job; knowledge of their needs as well as worries concerning legal risks and issues where the employee can be considered a liability to the company.

According to a 2013 Disability Survey in New Zealand, only 50% of individuals with a disability are active in the work force (Stats NZ, 2014). This includes those who are currently 'employed' and 'not employed but available and actively looking for a job'. The survey also reported that around 41% of individuals with ID and 43% of those with learning disability participated in the work force. The rate of participation among those with disabilities is therefore considerably lower compared to those who do not have a disability (76%).

Individuals with Autism Spectrum Disorder and Intellectual Disability in the Employment Sector

According to the fifth edition of the Diagnostic and Statistical Manual (DSM-5), published by the American Psychiatric Association (2013), the diagnostic criteria for ASD include limited and repetitive patterns of behaviours and social communication deficits. ID on the other hand is characterised by deficits in intellectual and adaptive functioning within the conceptual,

social and practical domains. It is also noted in the DSM-5 that there is a frequent comorbidity of ASD and ID.

Despite the stigma of hiring individuals with disabilities, fortunately, there are companies that see the benefit of doing so and are indeed willing to hire them. These companies include large and famous multinational companies. SAP Software Company is one of the pioneers that appreciate neuro-diversity in their company. They have been hiring and training individuals with ASD since 2013. Their training component also includes social skills training. Other than training, both SAP and Microsoft also provide a mentor, a fellow colleague, for employees diagnosed with ASD (Cappelli & Shattuck, 2019; CBS, February 11, 2018; John, Flower, Trezona, & White, 2017; Nadkarni, May 20, 2018; Phillips, April 4, 2019).

'Specialisterne Foundation' is currently working with many major companies in providing assessment and training for employees with ASD to work in the business sector. According to Thorkil Sonne, the founder of 'Specialisterne Foundation', there are skills that some individuals with ASD possess that others don't, such as careful attention to detail (Loyd, 2018; Specialisterne, 2012).

Furthermore, there are also career services that help individuals with disabilities in finding employment around the country. Such services in New Zealand include 'Workbridge' and 'Career Moves'.

Although there is a recent rise in employment among individuals with ASD, there are limited reports on companies hiring individuals with an ID. A study by Phillip, Ouellette-Kuntz, and Rosemary (2007) suggested that limited availability of training programmes for individuals with ID is the main reason for the low employment rate for this group.

With the potential benefits and recognition of employment among individuals with ASD, and limited employment for individuals with ID, it is evident that there is a need for research aimed at developing training programmes to better prepare these groups of people for employment.

Rate of Employment among Individuals with Autism Spectrum Disorder and Intellectual Disability

In recent years a significant increase in the number of individuals diagnosed with Autism Spectrum Disorder (ASD) has become evident. This increase is likely due to social awareness of the disorders as well as changes in diagnostic criteria (Keyes et al., 2011; Matson & Kozlowski, 2011).

According to the Centers for Disease Control and Prevention (2018), the global prevalence of ASD is 1 in 59 (1.7%) and the prevalence of ID is 1 in 100 (1%) (Maulik, Mascarenhas, Mathers, Dua, & Saxena, 2011). An estimated 1 in 100 (1%) people in New Zealand are diagnosed with ASD (Ministry of Health, 2020). In 2011 the New Zealand Ministry of Health (2011) published a report based on a 2008 health survey estimating that around 0.7% of the population in New Zealand has an ID diagnosis and among these, more than 50% are aged between 15 and 64. This age group is also New Zealand's typical working age group (New Zealand Goverment, 2019; Stats NZ, 2017b).

An Australian report stated that more than half of those who were diagnosed with ASD were unemployed (Neary, Gilmore, & Ashburner, 2015). This is also the same in the United States of America where more than 50% of ASD youth were unemployed 2 years post-secondary education; and only 55.1% were employed within 6 years of leaving secondary education (Shattuck et al., 2012).

A survey conducted by Siperstein, Parker, and Drascher (2013) in the United States of America, with a nationally representative sample size (n=1017), revealed that the labour force participant rate among survey participants with ID (aged 21-64 years old) was 44%. However, only 34% of the participants were actually employed and only 18% of them were competitively employed. The survey also reported that 28% of all participants were never employed. These results revealed that there is a concerning low rate of employment among individuals with ID and intervention should take place to help the affected group to seek and secure meaningful employment.

Finally, the annual average employment rate in New Zealand from 1986 to 2019 is 62.64% and it is ranked at number 29 in the world as of the first quarter of 2019 (Trading Economics, 2019). This shows that there is still room for improvement with regards to increasing the employment rate in this country.

Social Behaviours of Individuals with Autism and Intellectual Disability

Social skills play an increasingly significant role in securing and maintaining employment. Between the years of 1980 and 2012, there was a 12% increase in jobs that require high levels of social interaction (Deming, 2017; Tsang, 2003). Among other interpersonal skills, the ability to communicate, listen and influence others are important skills to have especially when an individual is working in a team (Mohrman & Cohen, 1995).

Unfortunately, a lack of social skills is a key characteristic of individuals with ASD (Frye, 2018; Jobe & White, 2007) and it affects their ability to communicate effectively with others (Elsabbagh et al., 2012; Lorenz, Frischling, Cuadros, & Heinitz, 2016). This is one of the main barriers for individuals with ASD in securing and maintaining employment (Chen et al., 2014; Sperry & Mesibov, 2005).

The presence of social impairments is not restricted only to those with ASD, but also presents in individuals with ID (C. A. Payne, 2015; Wing & Gould, 1979). There is a high prevalence of anti-social behaviours among individuals with ID (Dickson, Emerson, & Hatton, 2005). In addition to that, individuals with ID experience a delay in 'basic social skills' aquisition. One of these skills is communication, and the deficit in their skills is positively correlated with the severity of their disabilities (De Bildt et al., 2005).

Benefits of Social Skills

Humans are social beings and they live in interdependent societies. They form groups like families, tribes, friendships, nations etc., and members of the group work together to help each other out (Taflinger, 1996). There are many situations in life, such as at school or at work, which require social interaction, and social skills are the foundation of such interactions. This enables individuals to achieve goals, such as work and interpersonal goals (Elliott, Malecki, & Demaray, 2001).

Social skills are learned behaviours that are socially acceptable and it allows an individual to interact with others in a manner that will produce positive responses as well as to avoid negative responses (Gresham & Elliott, 1984). It is also noted that social skills influence an individual's social and psychological wellbeing.

The concept of social skills has often been said to be related to social competence (Elliott & Gresham, 1993; Gresham, 1988). According to a study by Argyle and Lu (1990), social competence is a contributing factor to a person's happiness. In addition, there seems to be a feedback loop where, according to Natvig, Albrektsen, and Qvarnstrøm (2003), having social support contributes to an individual's happiness and at the same time, happier individuals received more support from their peers. Argyle (2007) further stated in a review

that the indirect link between happiness and social factors could influence a person's health and well-being.

Social skills appear to be broadly important. Unfortunately, people with ASD and ID have a deficit in their social domains. This shows the critical importance of strategies to help them in this area, in preparation for employment. It is believed that, with support, individuals in this group may be able to either overcome or better deal with such barriers to thereby reduce negative influences on employment opportunities (Khayatzadeh-Mahani, Wittevrongel, Nicholas, & Zwicker, 2019).

Past and Other Studies on Social Skills Interventions

Over the years, many studies, using diverse methodologies, have been conducted to explore ways to increase social behaviour among individuals with ID, especially in those individuals with ASD. Such studies have considerably progressed knowledge in different social skills intervention.

A study in the 1960s used electric shock therapy to modify the participant's 'autistic behaviours' after failed response to 'traditional methods'. The study was successful at eliminating unwanted behaviours, such as self-stimulation and tantrums, and increased other social behaviours when it was paired with shock reduction (Ivar, Benson, & James Q, 1965). Although there was success in achieving target behaviours, these methods are today considered unethical. Researchers have since investigated more ethical and effective methods of teaching social skills.

Today, social skills interventions centre on positive behaviours and adopt 'non-aversive methods', such as modelling; reinforcement and coaching, to improve behaviours of an individual (Elliott & Gresham, 1993). In the past, fewer studies of methods that used

technological approaches were conducted, simply because technologies were not as accessible as they are today. For example, in the 1980s, a group of researchers tried to induce increased social behaviour by providing a step-by-step training on how to initiate conversations with others, using items that were popular among young people at that time. Results showed that the training was successful and was generalizable across settings. All individuals were able to learn and increase levels of social initiation and the behaviour was maintained up to four months post intervention (Gaylord-Ross, Haring, Breen, & Pitts-Conway, 1984).

Verbal reinforcement was also quite effective in teaching social skills among children. Nientimp and Cole (1992) also reported that skills learnt using verbal reinforcement were maintained and are generalisable to others.

Pivotal Response Training (PRT) is another non-technology based method that is being explored as an intervention for social skill development. This is an evidence-based method and has been successfully used to increase complex social behaviour with children (Lei & Ventola, 2017; Pierce & Schreibman, 1995).

However, as society enters the era of technology, interventions that utilise the convenience of technology are slowly increasing. With modern technology becoming more accessible, it will be of great benefit to utilise such technologies for interventions. Researchers have spent decades studying interventions for social skill development and, over the recent decades, there has been an increase of intervention methods that use relatively recent technology. Technology allows individuals to be more independent (Agree, 2014) and, because it is also flexible, it allows personalised interventions according to individual needs.

For example, a study conducted by Gilson and Carter (2016) attempted to promote social interaction in a work place using a Covert Audio Cueing approach. While not being

overy intrusivel, this approach allowed the participant to stay on work tasks. The study was a success as there was an increase in social interaction among the participants who also remained on task.

Goldsmith and Leblanc (2004) have reviewed a number of interventions that utilised technologies for children with ASD. Among the interventions reviewed, tactile prompting, video technologies and robotics were the few that were used in social skills intervention. While tactile prompting was quite effective for social initiation (Axe, 2012; Shabani et al., 2002; Tzanakaki et al., 2014), it is also intrusive and requires high demands on human resources. Robotics on the other hand, though it sounds promising, is still relatively new and in need of more research. Video technology is likely to be one of the most cost-effective, convenient and easy to use tools compared to the other technology-based interventions.

Video Based Intervention for Social Skills

Due to the convenience of technology, there is an increased interest in Video Based Interventions (VBI) among researchers (Mechling, 2005). VBIs help individuals to learn and perform targeted behaviours, gain feedback on their performance and this intervention is a great platform for learning basic instructions, especially among children (Sturmey, 2003). VBIs use ‘videos clips’ as an independent variable for intervention and have been shown to be an effective intervention for individuals with disabilities, and especially those with ASD (Rayner, Denholm, & Sigafoos, 2009). According to a review by DiGennaro Reed, Hyman, and Hirst (2011), such technology is also suitable for use in social skills interventions.

Examples of VBI include ‘Video Modelling’, ‘Video Prompting’, ‘Video Self-Modelling’, ‘Computer-Based Video Instructions’ and ‘Video Priming’ (Rayner et al., 2009). These have been successfully used as interventions for social skills and functional skills (Ayres & Langone, 2005). Yet, the evidence for VBIs in an employment setting is limited.

A systematic review by Anderson et al. (2016) on interventions for individuals with ASD to increase employment revealed that there a lack of research on video-based intervention for this group of people in terms of employment.

Video prompting.

Video prompting works by having an individual watch video clips of a task one step at a time. The individual would complete the first step before watching another video showing the second step and this continues until the task is completed (H. Cannella-Malone et al., 2006). This is an effective method to use for completing complex tasks that consist of a sequence of multiple steps (Grab & Belfiore, 2016), such as many self-help skills, for example making a sandwich.

Video prompting has successfully taught individuals with neurodevelopmental disabilities to acquire daily living skills (Bereznak, Ayres, Mechling, & Alexander, 2012; Cruz-Torres, Duffy, Brady, Bennett, & Goldstein, 2020) such as food preparation (Johnson, Blood, Freeman, & Simmons, 2013), putting away groceries (H. Cannella-Malone et al., 2006), cleaning tasks (H. I. Cannella-Malone et al., 2015; Sigafoos et al., 2006), simple culinary skills (D. Payne, Cannella-Malone, Tullis, & Sabielny, 2012); and other vocational skills (Bereznak et al., 2012; Heider, Cannella-Malone, & Andzik, 2018).

Video priming.

'Priming' is an antecedent intervention event and aims to make novel events and situations more predictable (Schreibman, Whalen, & Stahmer, 2000). Video priming uses the principle of priming by providing a visual stimulus in the form of videos of novel situations or settings. Video priming was effective in decreasing problem behaviours, such as disruptive behaviours associated to changes, among individual with ASD (L. K. Koegel, Koegel, Frea, & Green-Hopkins, 2003; Schreibman et al., 2000).

Increasing the predictability of novel and future events also helps with the increase of social initiation among individuals with ASD (Gengoux, 2014; Zanolli, Daggett, & Adams, 1996) because it allows individuals with ASD to have proficiency within the upcoming event. This can also change the social dynamics between them and their neurotypical peers. It happens due to both groups having a chance to work together as more equals rather than is seen when one group supports the other to perform different tasks and activities (Kennedy & Itkonen, 1996).

Video feedback

Video feedback is a main component used in cognitive therapy for Social Anxiety Disorders (Warnock-Parkes et al., 2017). It works by providing the individual watching the video a playback of their performance (Shirotsuki, 2018) where feedback on their performance is/can be provided by either themselves or a third party (English et al., 2017).

A number of studies supported the efficiency of video feedback, used either on its own, or with other interventions for children in: increasing social behaviour; decreasing disruptive/unwanted behaviours (Deitchman, Reeve, Reeve, & Progar, 2010; Kabashi & Epstein, 2017; Oke & Schreibman, 1990; Thiemann & Goldstein, 2011) as well as with adults in social and vocational skills (Barnes, 2012; English et al., 2017). Targeted behaviours were maintained post intervention.

Modelling

Learning through modelling or observational learning was an idea introduced by Albert Bandura in the 1970s (Bellini & Akullian, 2007) and it is a highly useful method for learning in various situations (Haston, 2007).

When Bandura first introduced the idea of observational learning, he also added that there are two types of observational learning, which are imitation and vicarious learning (Bandura, 1977). Imitation learning is the process of an individual replicating observed behaviou, while vicarious learning is the process of learning whereby the observer will either reproduce or not reproduce observed behaviour, depending on the observed consequences of the model.

Most behaviour an individual exhibits is learnt either intentionally or unintentionally from a source or a 'model'. Learning through modelling decreases the number of trial and errors needed to perform a task correctly. In addition to that, some complex behaviour/task can only be learnt through a model, such as speech and language (Bandura, 1977).

Based on the Social Learning Theory by (Bandura, 1977) and its analysis on modelling, modelling is ruled by four interrelated sub processes. The first is the 'attentional processes', whereby the observer must pay attention or recognise the model's behaviour in order to learn from them. Next, is the 'retention processes', where the observer must remember what was shown to him/her. The 'motoric reproduction processes' comes after the retention processes. It is defined by whether or not the observer has the skill to reproduce what he observed. If he does, he can incorporate observed skills into actions easily. Lastly, the 'reinforcement and motivational process' is defined by the observer's motivation to perform learned skills. If the observer observes targeted skills that are positively reinforced, the observer will be more motivated to transfer targeted skills into actions. This is also called the vicarious reinforcement, and it is defined by when the observed consequences of the model influence the outcome of the observer's behaviour.

Other than vicarious reinforcement, Bandura (1977), also added that observational learning is motivated self-reinforcement. Self-reinforcement is where individuals rewards

themselves, when they achieve a certain behaviour (Artino, 2011; Bandura, 1976). However, contrary to Bandura's social learning theory of observational learning, many researchers noted that that response behaviour should be reinforcement (extrinsic reinforcement) in order for the observer to learn (Baer & Sherman, 1964; Gewirtz & Stingle, 1968).

Furthermore, the behaviour analyst's view on observational learning is different from Bandura's hypothetical construct (e.g. motivation) of social learning. The behaviour analytical approach offers a more conceptualised framework of modelling. Taylor and DeQuinzio (2012) proposed that an individual's history of learning, and how that history relates to enviromental factors, can be manipulated to influence an observational. For example, if an individual was rewarded for imitating a similar behaviour in the past or if they have developed a 'generalised imitative repertoire', it increases their chances for imitating future behaviours. Taylor and DeQuinzio (2012) also included that external support (such as prompts) are required in order for observational learning to occur, and this is especially so among individuals with ASD.

Although observational learning is an important skill, it does not come naturally for individuals with ASD. Such skills may need to be taught to those who are struggled with it. Taylor and DeQuinzio (2012) summarised step-by-step strategies to aid with observational learning. In their opinion, the strategies include teaching observers to: maintain attention to the models; imitate models; distinguish between positive and negative consequences of an observed behaviour (conditional discriminations) and lastly allowing observers to practice learnt skills as well as giving them the oppourtunity to practice in mainstream settings (e.g. in classroms).

Video models can take different forms, including 'in-vivo modelling', 'video self-modelling' and 'video modelling'. 'In-vivo modelling' involves life models during the

intervention while 'video modelling' and 'video self-modelling' uses videos of models for intervention (Charlop-Christy, Le, & Freeman, 2000; K. McCoy & Hermansen, 2007; Ogilvie, 2011). The difference between video modelling and video self-modelling are the models used in the video. In video modelling, the subject can be anyone. In contrast to video modelling, video self-modelling's subject depicts the observers themselves. When comparing in-vivo modelling and video modelling, according to Charlop-Christy et al. (2000), the latter is more effective than the former method.

Video self-modelling.

Video self-modelling (VSM) is a video based modelling technique where individuals watch a video of themselves performing a certain targeted behaviour successfully (Delano, 2007; Merrill & Risch, 2014). It enables the individual to learn, maintain and generalise targeted behaviours (Hitchcock, Dowick, & Prater, 2003). Reviews has revealed that VSM could be successfully used as either a stand-alone intervention or in a multicomponent intervention for social skills intervention (Hitchcock et al., 2003; Kabashi & Epstein, 2017; Kabashi & Kaczmarek, 2017; Litras, Moore, & Anderson, 2010).

Self-modelling was first introduced by Creer and Miklich (1970) after a failure of using role play in increasing living and social skills. Since then, there has been an increase in literature on self-modelling (Hitchcock et al., 2003).

In 1997, Bandura stated that it is beneficial for learners to witness themselves successfully perform targeted skills. This is because it allows that person to know how to perform those skills the best and it also helps them feel confident about their own capabilities (as cited in Hitchcock et al., 2003). Bandura (1982) also explained that an individual's own beliefs about their capabilities to perform a task is called self-efficacy. He stated that if a person believes in their own ability to perform a task, there is a higher chance that they will

accomplish it. According to Schunk (1987) and Schunk and Hanson (1989), self-efficacy can be influenced by an individual's perceived similarity to the model. However, Dowrick (2012) argued otherwise. He stated that an observed behaviour can be replicated if the observer has the required component to do so instead of perceived similarity to the model.

An extensive review by Dowrick (1999) outlined 7 categories that contributed to the efficiency of self-modelling. The factors are summarised as:

"1. Clarification of goals and outcome,

2. Demonstrating a positive self-image,

3. Reminders of previous competence,

4. Repeated observations of competent role-play,

5. Observation of one's skills applied to a new setting,

6. Anxiety-free behaviour or successful outcomes despite anxiety,

7. Demonstrations of new skills composed of pre-existing subskills." (pp.36)

However, there was no evidence that VSM is more effective for individuals with ASD when compared to Video Modelling (VM). According Schunk and Hanson (1989), VM using peers as models were equally effective as VSM. A meta-analysis by Bellini and Akullian (2007) on VM and VSM, also stated that both methods of modelling were equally as effective and can be considered as evidence based.

In Hitchcock et al. (2003)'s review on 18 researches using VSM revealed that the said method could be used for interventions related to communication, behaviour and academic performance. He also states that VSM is easy to use, cost-effective, and that learnt skills are more likely to generalise across settings and people. Mason et al. (2013) on the other hand,

argued that VSM is more challenging to use when compared to Video Modelling using others as models as it is more time-consuming. Also on the contrary to claims by Schunk and Hanson (1989) and Bellini and Akullian (2007), a review by Mason et al. (2013) indicated that VSM is significantly less effective than VM using others as models. They suggest the complexity of producing the videos for VSM as the contributing factor to its decreased effectiveness.

Video modelling.

Video modelling (VM) is an intervention that uses the technology of video recordings and the principle of modelling. VM can help in acquiring new behaviours (Tuong, Larsen, & Armstrong, 2014). It works by having an individual watch a video of a successful targeted behaviour (Bellini & Akullian, 2007). According to Charlop-Christy et al. (2000), VM is effective for generalisation of skills learnt and it also enables observers to acquire observed skills in a short amount of time. Furthermore, according to Maione and Mirenda (2006) and Olçay Gül (2016), VM is also an effective social skills intervention when it is used in conjunction with other interventions among individuals with ASD and ID.

Videos used for modelling should be short and simple with well-defined steps; and if these conditions are met, the more an individual watches the video and practices the target skills, the higher chance they will acquire and generalise them (Ogilvie, 2011).

Different types visual cues can be used for VM. When comparing two types of visual cues for modelling, a study using either picture (edited into a form of video with voice over) or video cues concluded that there was no difference in effectiveness between the two formats (D. M. McCoy, Morrison, Barnett, Kalra, & Donovan, 2017). This study was conducted among pre-schoolers to increase participation and decrease disruptive/off-task behaviours during ‘carpet time’. During the intervention, pre-recorded videos of targeted

'carpet time' behaviours were recorded and were used as the first independent variable for the study. Still frames (snapshot photos) of the same videos along with voiceover narratives were used as the second independent variable for this study. Both methods (video and still frames) were equally effective but the participants and their teacher preferred the video version.

In terms of the models, Bandura (1969) suggest that, in most cases of modelling, it would be more effective for the observer share common attributes as the models (in the video). On the contrary, a review by Mason et al. (2013) indicated that adult models are more effective than peer modelling. They further stated that VSM is also more effective than peer modelling, leaving 'peers as models' the least effective when compared to VSM and VM using adult models.

Mason et al. (2013) opined that there are a number of unanswered questions to be addressed before VM (VSM included) can be considered as an evidence-based intervention. One of their criticisms was regarding VM methodology. The meta-analysis revealed that there are insufficient details to standardise the usage of video-based modelling techniques for future research, and they cited a need to address the social validity of the techniques. Furthermore, it the review also stated that there is a need to address the purpose for using video-based modelling, its targeted population and their age group, as well as the outcomes of the intervention.

However, a systematic review by Qi, Barton, Collier, and Lin (2018) presents somewhat conflicting viewpoints. They argued that VM is indeed an evidence-based practice that can function as an intervention for individuals with ASD in improving their social skills.

In comparing both these analyses, while the meta-analysis by Mason et al. (2013) is extensive, it is also less specific when compared to the arguments made by Qi et al. (2018). Mason et al. (2013) included application of video-based interventions (VM and

VSM) in individuals with Attention Deficit Hyperactivity Disorder (ADHD) and behaviour disorders, while Qi et al. (2018) specifically examined studies of VM on social skills with individuals diagnosed with ASD. This study addressed the comment by Mason et al. (2013) on the need in specifying the purpose of video-based modelling and the targeted population. Furthermore, Laver and Wilkes-Gillan (2018) also supported the findings of Qi et al. (2018) and they added that adaptation of VM is needed because individuals with ASD present with an array of symptoms.

Therefore, while it may be true that video-based intervention in general terms is not an evidence-based practice, VM specifically is an evidence-based practice for social skills intervention among individuals with ASD.

Video modelling in employment settings.

VM has shown positive results in teaching vocational skills among individuals with ASD. However, there are only a handful of studies that explore VM in an employment setting, and most of them are on vocational rather than social skills.

A study by English et al. (2017) revealed that VM and VFB are effective in teaching vocational skills to individuals with ASD. Two out of the three participants learnt and maintained targeted vocational gardening skills between one to six weeks post intervention, while the third participant required Video Prompting (VP) to learn the targeted skills. This research taught vocational skills using technology (iPad4 and iPod4) where instructional videos were loaded onto the devices for the participants to use as prompts between different steps of the targeted skills. Participants then went through a process of fading and withdrawal.

VM was also used to teach complex job skills to individuals with ASD, such as responding to phone calls (Rausa, Moore, & Anderson, 2016). In this 2016 study, the

participant watched the peer modelled videos of four targeted behaviours. Although the phone calls in this study were simulated, the approach still resulted in the participant acquiring the targeted skills and the skills were maintained six weeks post intervention.

Video modelling and social behaviour.

VM has been used in several studies to investigate its effectiveness in influencing social behaviour. It was concluded that VM is very effective in addressing several social behaviours among children including 'joint attention', 'social engagement' (Ho, Gadke, Henington, Evans-McCleon, & Justice, 2019), 'social initiation', 'conversational skills' 'appropriate non-verbal communication', 'asking and answering informational questions' (Alzyoudi, Sartawi, & Almuhiri, 2015; Nikopoulos & Keenan, 2004a, 2004b), and that target behaviours were maintained months post intervention. Nikopoulos and Keenan (2004b), in an extension of their previous research, also concluded that learnt skills from VM could be generalised across stimuli.

VM used as a part of a multi-component social skills intervention, such as with self-management strategies and Behavioural Skills Training (BST), also showed success in increasing social initiation, expressing wants and needs, conversation, and turn-taking among individuals with ASD and ID. (Apple, Billingsley, & Schwartz, 2005; O'Handley, Ford, Radley, Helbig, & Wimberly, 2016).

A meta-analysis by Bellini and Akullian (2007) reviewed twenty-three studies published between 1987 and 2005. The analysis concluded that VM and VSM are effective interventions for individuals with ASD in teaching social-communication skills, functioning skills and behavioural functioning. This meta-analysis examined a total of 73 participants across four countries, with ages of the participants ranging from 3 to 20 years old. Although there was evidence for the effectiveness of VM and VSM, of 23 studies, only one study (with

three participants), was conducted with young adults. The other 22 studies were conducted mainly among children, with two studies involving adolescents. Also, the only study that was conducted on the young adults examined just functional, not social, skills. Therefore, this meta-analysis does not accurately reflect on the effectiveness of VM and VSM in teaching social communication skills to adults with ASD.

Video modelling and social behaviour in employment settings.

There seems to be a lack of studies that address social skills in an employment setting. The most recent research conducted was on VM in combination with another programme to aid learning and to help individuals with ASD and ID to acquire different skills. In 2017, research was published on the use of VM in combination with a social skills programme called 'The Walker Social Skills Curriculum: ACCESS (Adolescent Curriculum for Communication and Effective Social Skills)'. This was developed by Walker, Todis, Holmes, and Horton (1988). The aim of this study was to investigate the effectiveness of the programme and VM in increasing social skills relevant for workplace inclusion. Participants went through the social skills training twice a week for twenty weeks to learn targeted social communication skills. The researchers, Walsh, Holloway, and Lydon (2017), observed an increase in social communication skills among the participants and these skills were generalised across people and settings within the centre that ran the programme. Social communication skills of the participants were maintained three months post-intervention. The researchers also found that not only was there some increase in social communication skills among the participants, but also that there was a decrease in problem behaviour.

A systematic review on social skills intervention among adults by Ke, Whalon, and Yun (2017) noted that at the time of their review, there were no studies that reported on social

skills in employment settings. This explains why it was challenging to look for more of such studies, thus, creating a need for future research to be directed towards this goal.

Summary

In the past, individuals diagnosed with ASD and ID have been discriminated against in the employment market due to lack of knowledge of how best to work with them. Unemployment among individuals with ASD is still common, even though they (i.e. individuals with ASD) have a high desire to participate in the workforce (Chen et al., 2014; Hendricks, 2010). Added to the fact that there is an increase of diagnoses of ASD, it becomes clear that something must to be done to help individuals with ASD and ID to achieve to their full potential and to have a more independent life. This would benefit not only the individuals concerned, but also relevant government agencies (such as welfare providers) and society as a whole.

Fortunately, over recent years, some larger companies have begun to acknowledge the benefits of neuro-diversity in their companies. Their efforts may well encourage other companies to follow in their footsteps. With an increase in employment opportunities there will be a need to find ways to help individuals with ASD and ID to cope with employment that can be generalised across settings and occupations.

One of the main barriers that individuals with ASD and ID face, that diminishes their chances of employment, are limitations in their social skills (Frye, 2018; Jobe & White, 2007). While deficits in social skills is one of the main features of an ASD individual, individuals with ID are also reported to have social deficits (Wing & Gould, 1979). Just like everyone else, individuals with ASD and ID have their own talents and unique characteristics that are beneficial to the broader workforce.

Most social skills studies were conducted among children and adolescents and these are not directly relevant to adults seeking employment. As others have pointed out, social skills training and social integration support for employees in a workplace is necessary to promote social interaction within the workplace (Mautz, Storey, & Certo, 2001).

With both modelling and learning visually being very effective for learning and retention of learnt information and skills, VM is hypothesised to be highly effective in teaching new skills to individuals, including individuals with ASD and ID. In addition to this, the use of such technology is very accessible in today's world. According to DiGennaro Reed et al. (2011), video technologies are the most common technology being used today and have a low cost of implementation. In their review, they also concluded that technology is suitable for use in social skills interventions. Besides that, there are many other advantages in using technologies in providing interventions. The use of technology means that there are reduced needs in having skilled clinicians to deliver interventions; this would also help decrease costs incurred in interventions. Furthermore, the use of modern technologies in interventions can also promote independence especially among individuals who access the technology, as it is generally handy and easily accessible.

hroughout the years VM has been used to teach different skills across different age groups and a considerable amount of research in the field has shown positive results. However, a recent systematic literature review on the usage of VM and VP as an intervention for individuals with ID revealed that the most common skills taught using this method are living skills, including daily living skills (Park, Bouck, & Duenas, 2018). Not many studies were conducted on the useful of the methods in acquisition of social skills among individuals with ID. The need to expand social skills intervention for individuals with ID seems evident as they too experience social limitations.

On the other hand, among individuals with ASD, VBIs are mainly used as an intervention for development of social skills due to these being one of the defining characteristics for ASD individuals, as cited in Park et al. (2018). Although many studies conducted were successful, most of them were not conducted with older populations (e.g. >20 years old) and therefore the generalisation of VM as an intervention cannot be concluded across age groups nor for employment settings.

A systematic review conducted by Anderson et al. (2016) revealed that there is also limited research that uses VBI to aid employment among individuals with ASD. This showed that there is a need for more studies that explore such intervention with regards to employment.

A review by Delano (2007) concluded that VM is a highly effective and very suitable intervention for individuals with ASD in regards to teaching social communication skills. It (VM) is also highly effective in comparison to many different evidence-based social skills interventions for ASD (Wang & Spillane, 2009).

VM was shown to produce significant generalisation and maintenance of the target behaviours (Nikopoulos, 2007). In addition to that, there are many advantages to using VM. It requires less time for an individual to learn target skills; it is cost-effective, as well being very effective in increasing participants' motivation to learn (Charlop-Christy et al., 2000; Wynkoop, 2015). Also, according to Charlop-Christy et al. (2000), participants learn tasks faster using VM when compared to in-vivo modelling. Given that VM has been successfully used as intervention for individuals with ID, even though it was to teach living skills; this suggests that that VM is a promising tool for social skills intervention in this group.

Problem Statement

Most of the studies exploring the utility interventions focused on social skills for children, with just a few being conducted in adults, and very few with direct relevance to employment issues. Human beings are social; therefore, it is crucial to possess some social skills in everyday life. Social skills are beneficial in an employment setting, as these would help individuals to be more included in the workplace environment.

Although this review shows that VM appears to be a very promising intervention with regards to social skills among individuals with ASD and ID, many of the available studies were conducted with children and adolescents. There is still a need for research investigating the effectiveness of VM in teaching social skills to adults with ID or ASD.

Furthermore, there are only a handful of studies conducted using VM in the vocational setting. Since there is an evident need for intervention to help individuals with ASD and ID to secure employment, more studies should be conducted to investigate the effectiveness of using VM to teach different skills, including social skills, in a vocational setting to individuals with ASD and ID. The lack of social skills is one of the main barriers for individuals with ASD and ID in securing and maintaining employment. Making more efforts to teach social skills to individuals with ASD and ID would enable these people to have a solid platform for having basic interaction skills with their colleagues.

With the rationale stated above, it is reasonable to conduct studies that address social skills issue among individuals with ASD and ID by using a method that seems promising (VM). Therefore, this study aims to investigate the effectiveness of VM in teaching social skills to adults and especially surrounding social skills in an employment setting.

Objective

The objective of this study is to investigate if VM would improve social behaviours of individuals with ASD and ID in an employment setting.

Chapter 2:
Methods

Participants

Two participants volunteered to participate in this study. Both of them were fairly new clients of a local supported employment service.

Jake (pseudonym) was a 49-year-old man who has a diagnosis of Intellectual Disability (ID). He was previously employed as a fruit picker and newspaper delivery person. Jake had recently moved to this area and sought help from the 'support employment service' for a job.

Finn (Pseudonym) was a 20-year-old man with a diagnosis of Autism Spectrum Disorder (ASD) and a previous history of anxiety. He reported that he had learnt ways to manage his anxiety well, thus, does not experience this as often anymore. Finn was employed very briefly in the past through a 'supported employment service', however, due to the insufficient availability of jobs, he was unemployed for the past 10 months.

Both participants communicated in English and were able to understand verbal instructions. Jake and Finn had only recently started work when they participated in the research. They both worked once a week, but on different days. Jobs selected for them differed each week depending on what needed to be done for the day.

Settings

This study was conducted with an organisation that provides different services to the disabled community in New Zealand. One of its' services is a supported employment service. This is a service that provides individuals with disabilities an opportunity to gain work experience in preparation for them to secure a proper and permanent employment in the future.

Data was collected in the waiting area where the participants and their colleagues waited to be picked up by their supervisors to be transported to their workplace. The waiting area is located at the cafeteria where colleagues can sit together at a table while waiting.

Ethics

This study was approved by the human research ethics committee and informed consent was obtained prior to data collection

Recruitment

The team leader identified participants based on an inclusion criterion of having a disability of either ASD or ID, above the age of 18 and is or about to start their job. Contact details of those who are interested were passed on to the researchers to arrange for meet up. Information on the study was discussed and consent form was signed during the meet up.

Materials

Consent forms, study information sheet, participant recruitment flyer, data collection sheet, and videos for video modelling were used in this study.

Data collection sheet.

A data collection sheet developed by researchers was used for the study. It consists of seven targeted behaviours (dependent variables). The targeted behaviours were: greeting others; introducing self; asking about others' interest; initiating conversation not related to other variables; 'responding to others'; 'asking "how are you?"' and 'asking for help'. The variables were divided into boxes and spaces were allocated for tally marks to be recorded during the observation period.

Videos.

Researchers were the models in the video. Short clips of different social skills were pre-recorded using a smart phone in a third person perspective. It was then edited into suitable length and speed. The length of the videos ranges from around 10 to 30 seconds. The videos were of 'greeting others'; 'introducing self'; 'asking about others' interest'; 'asking "how are you?" and 'asking for help'.

Greeting others.

In this video, researcher one greeted researcher two while waving at researcher two. This is recorded on two occasions. One was when researcher one was standing in front of researcher two and made eye contact before initiating the greeting, and the other was when researcher one walked into the building and both researchers made eye contact before initiating the greeting.

Introducing self.

In this video, both researchers were facing each other and researcher one introduced themself to researcher two which is then followed by an introduction from researcher two.

Asking about others' interest.

This video showed a researcher asking what the other person is listening to, what they like to do, as well as if they like a certain thing. This video consisted of both researchers asking and responding to questions.

Asking "How are you?".

This was recorded with researcher one standing in front of researcher two making eye contact before greeting followed by asking "how are you?" to researcher two. This video was

recorded on two occasions, one with both researchers standing and the other with both researchers sitting at the table.

Asking for help.

This video started off with one researcher struggling to complete a task. She then asked another researcher to help with the task.

Measurement

Frequencies of all social behaviours were recorded in 2-minute blocks during each session with a tally system using the data collection sheet. Missed opportunities were also tallied for a few variables/behaviours to calculate the percentage of behaviour emitted.

Variables with missed opportunities include ‘greeting others’, ‘responding to others’, ‘Initiating conversation not related to other variable’ and ‘asking how are you?’. Percentage of behaviour was calculated by dividing ‘opportunities taken’ by ‘total opportunities’ (opportunities taken + missed opportunities).

Dependent Variables

Dependents variables recorded during baseline and intervention were the frequency and percentage of the targeted behaviours. The targeted behaviours were: greeting others; introducing self; asking about others’ interest; initiating conversation not related to other variables; responding to others; asking “how are you?” and asking for help.

Operational Definition

Operational definitions for targeted behaviours were:

Greeting others.

'Greeting others' is defined by saying 'hi', 'hello', 'good morning', 'kia ora', 'morena'. This also includes waving at the person as a gesture to say hello. Behaviour is considered 'checked' when the participant emits one or more of the above behaviours upon seeing another person for the first time in the day. The other person has to be in close proximity (roughly 2 meters) to the person. Opportunity is missed when the participant saw the other party at close proximity but did not greet them.

Introducing self.

This is defined by saying "my name is [participant's name]" or "I am [participant's name] when meeting someone new. This criterion is also achieved when someone asked for the participant's name and the participant replies with their name. The criteria of 'meeting someone new' is fulfilled when participant reports that the person they meet is someone they have not seen/met before.

Asking about others' interest.

This is when the participant speaks to another person about a particular topic by asking questions. Questions can be a form of 'wh-' questions such as: 'who', 'what', 'when', 'where' as well as 'how'. Such questions would prompt the other party to reply with information relating to their interest as well as their likes and dislikes.

Initiating conversation not related to other variables.

This is when participants start a conversation/discussion with another person when there has been a lapse in discussion for 30 seconds. This is also achieved when participants start a conversation/discussion topic that is different from the previous conversation. The criterion is marked as not achieved or missed if the participant is not participating or initiating

conversation in a 2-minute time frame while being in close proximity or in a group with the anther person.

Responding to others.

This is achieved when participants emit a vocal response in a conversation between two or more people and the conversation is directed towards the participant. Opportunity is considered as 'missed' when the participant did not emit any response in a 30-second time frame, when spoken to directly or within 2-minutes in a group situation and when not being spoken to directly.

Asking "how are you?"

This is defined by participants asking another person "how are you?" or "how have you been?". Opportunity is marked as missed when participants did not ask the other party "how are you?" or "how have you been?" when they saw them for the first time in the day. Missed opportunities for this behaviour were excluded when the other party only walked past the participant.

Asking for help.

This is defined by participant asking for help or assistance with a task. This can be in a form of an enquiry about the location of a certain item or requesting any other information.

Experimental Design

This study was conducted using a single subject, multiple baseline across behaviours research design. Intervention for different targeted behaviours was introduced one at a time, after collecting baseline data from each participant on separate occasions.

Procedure

Data collection was scheduled to happen once a week as the participants only worked once a week. They participants were dropped off at a waiting area along with their other colleagues around 20 to 30 minutes before being picked up again to go to work. Both baseline and intervention data were collected during this time.

Baseline and intervention data were collected using the data collection sheet. Participants were observed once a week, for two weeks. Each observation session was divided into two-minute intervals. Targeted social behaviours displayed by the participants were recorded and the number of occurrences was tallied at the end of the baseline data collection.

Targeted social behaviours for intervention were selected based on the baseline data. 2 to 3 social behaviours identified for improvement were selected. Videos were given to each participant at least 4 days before intervention. The videos were loaded on to either their mobile phones or laptops. Participants were instructed to watch the videos every day.

Data collection sheet was again used during the intervention period. The procedure for data collection during the intervention period was the same as the procedure during the baseline data collection period. Researcher then organised another time to upload a new video for the participant to watch. Videos were given at least 4 days before the participant goes to work for the week.

Data Analysis

Data collected for both baseline and intervention period were calculated, and graphics representation of the data were created based on the total number of behaviours of each

variable. The effect of the independent variables on the participant's behaviour were analysed using a based on the visual representation of the data.

Interobserver Agreement (IOA)

For interobserver agreement check, two observers made simultaneous but independent observations. This occurs for 30% of all sessions. IOA was calculated based on the average of behaviour observed by researcher one and two. The total IOA for both participants (Finn and Jake) were 100%.

Chapter 3:
Results

Table 1 and Table 2 shows Jake's results collected from this study. Data for Jake's social behaviours were collected across 5 sessions. Baseline data for all behaviours were collected during session 1 and session 2. Three targeted behaviours were selected for intervention. Each behaviour intervention was introduced one at a time, across 3 sessions. Data for other behaviours not selected for intervention were also recorded.

Table 1

Jake's Frequency and Percentage Social Behaviours Displayed during Baseline and Intervention

	Frequency of opportunities		
Social behaviours	Available	Missed	Percentage of behaviour (%)
Greeting Others			
Baseline 1	5	2	60
Baseline 2	3	3	0
Baseline 3[a]	8	4	50
Intervention 1	4	0	100
Intervention 2	12	9	25
Introducing Self			
Baseline 1	1	0	100
Baseline 2	1	1	0
Baseline 3[a]	0	0	-
Baseline 4[a]	0	0	-
Baseline 5[a]	0	0	-
Initiating conversation[**]			
Baseline 1	3	0	100
Baseline 2	11	0	100
Baseline 3[a]	12	0	100

Baseline 4[a]	22	0	100
Baseline 5[a]	8	0	100
Responding to others			
Baseline 1	22	0	100
Baseline 2	48	1	97.92*
Baseline 3[a]	87	1	98.85*
Baseline 4[a]	23	1	95.65*
Baseline 5[a]	29	0	100
Asking "How are you?"			
Baseline 1	6	6	0
Baseline 2	3	3	0
Baseline 3[a]	8	8	0
Baseline 4[a]	3	3	0
Intervention 1	12	12	0

Note: *Figure rounded up to the nearest .01%; **Conversation initiated that is not related to other variables; [a]Data collected during the intervention phase of another social behaviour.

Table 1 depicts the frequency and percentage of 5 observed social behaviours displayed by Jake. Based on Table 1, Jake seems to be able to initiate conversations well. His rate of initiating conversation increased over the two sessions, Jake was also able to respond to others in a conversation quite consistently, where he responded to others >95% of the time during baseline 1 and baseline 2. Data for 'Introducing Self' shows that Jake was able to introduce himself to a new person during baseline 1 but failed to do so during baseline 2.

Also according to Table 1, Jake scored the lowest for 'Asking "How are you?"'. Despite having six opportunities during baseline 1, three opportunities during baseline 2, eight opportunities during baseline 3 and three opportunities during baseline 5 to exhibit the behaviour, he did not exhibit that specific social behaviour. He also did not consistently greet others. He only greeted people 60% of the time during baseline 1, 0% of the time during baseline 2 and 50% of the time during baseline 3.

Table 2

Jake's Frequency of Social Behaviour Exhibited during Baseline.

Social behaviour	Frequency of behaviour
Asking about others' interest	
Baseline 1	0
Baseline 2	0
Intervention 1	4
Intervention 2	0
Intervention 3	0
Asking for help	
Baseline 1	0
Baseline 2	0
Baseline 3[a]	0
Baseline 4[a]	0
Baseline 5[a]	1

Note: [a]Data collected during the intervention phase of another social behaviour.

Table 2 depicts the frequency of the remaining 2 social behaviours by Jake. Since missed opportunities for these 2 behaviours were not taken and therefore, their percentage of behaviour occurred are not calculated. Based on table 2, Jake did not ask for any help, nor did he ask about someone's interest during baseline 1 and baseline 2. Looking at both tables (table 1 and table 2), it seems like Jake has a deficit in 'manding' and verbal behaviours that involve 'asking' about something.

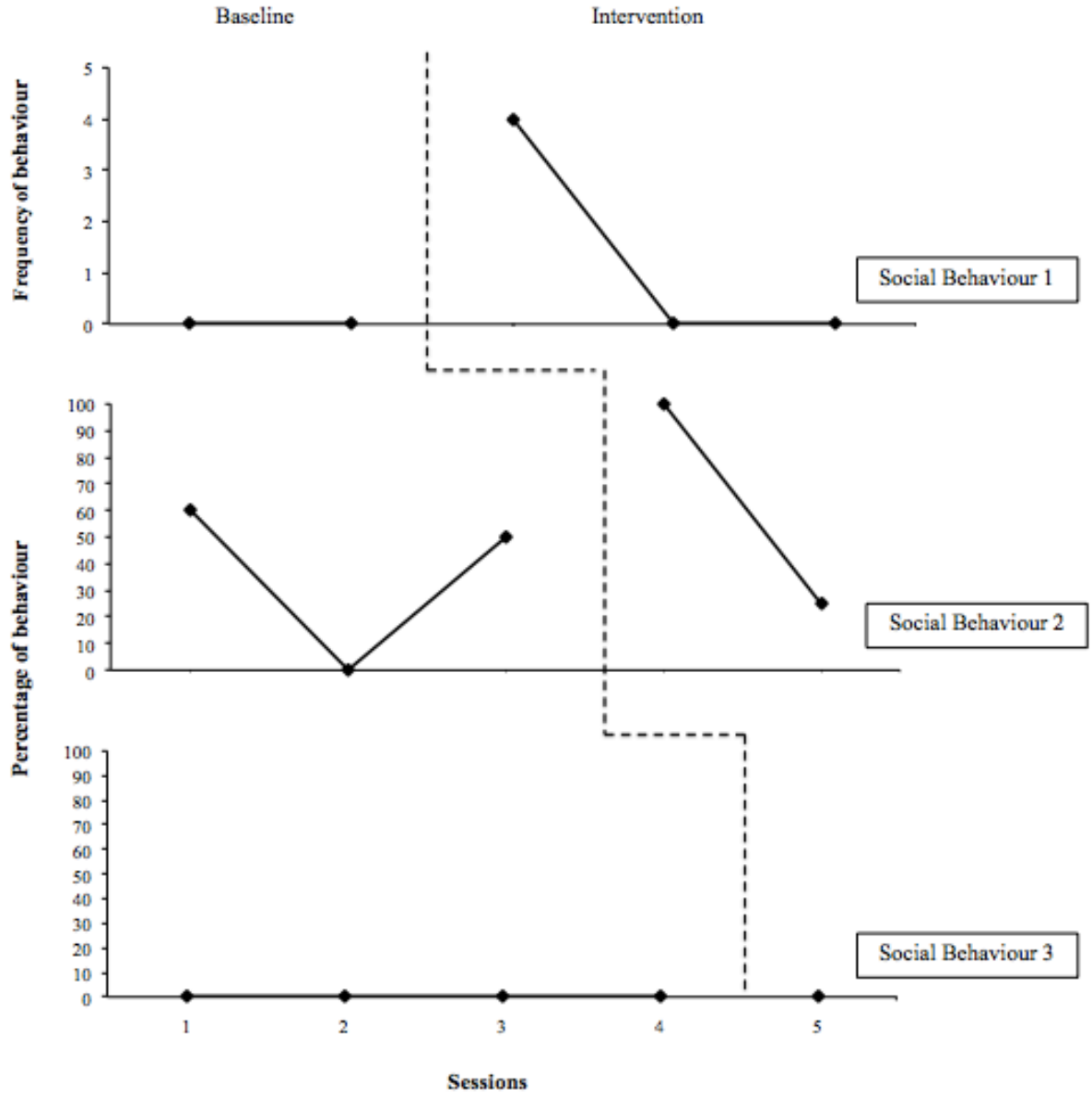

Figure 1: Frequency of social behaviour 1 (Asking about others' interest) and percentage of social behaviour 2 (Greeting others) and social behaviour 3 (Asking "how are you") across sessions for Jake.

Figure 1 depicts the baseline and intervention for 3 targeted social behaviours. There was a sharp increase (from 0 times to 4 times) in social behaviour 1 (asking about others' interest) during intervention and the effects of intervention 1 seems to have an effect on social behaviour 2, where there was also a sharp increase in social behaviour 2 by 50%. Unfortunately, social behaviour 1 decreased sharply during intervention 2 and remained at 0% during intervention 3.

A new video ('greeting others') was given to Jake for intervention 2. There was a sharp increase (from 50% to 100%) in Jake's social behaviour 2 during intervention 2. Unfortunately, the behaviour declined during intervention 3, where he only exhibited social behaviour 2 for only 25% of the time.

Lastly, intervention for social behaviour 3 (Asking "How are you?") seems to have no effect during its' intervention phase. Percentage for social behaviour 3 remained at 0% throughout the baseline and intervention phase.

Table 3 and Table 4 show the results for Finn collected in this study. Data for Finn's social behaviours were collected across 4 sessions. Baseline data for all behaviours were collected during session 1 and session 2. Two targeted behaviours were selected for intervention for the remaining 2 sessions. Each behaviour intervention was introduced one at a time, across 2 sessions. Data for other behaviours not selected for intervention were also recorded.

Table 3

Finn's Frequency and Percentage Social Behaviours Displayed during Baseline and Intervention

	Frequency of opportunities		
Social behaviours	Available	Missed	Percentage of behaviour (%)
Greeting Others			
Baseline 1	3	0	100
Baseline 2	2	2	0
Baseline 3[a]	7	5	28.57*
Intervention 1	13	8	38.46*
Introducing Self			
Baseline 1	1	0	100
Baseline 2	0	0	-

Baseline 3[a]	0	0	-
Baseline 4[a]	1	1	0
Initiating conversation**			
Baseline 1	3	0	100
Baseline 2	5	0	100
Baseline 3[a]	14	0	100
Baseline 4[a]	9	2	77.78*
Responding to others			
Baseline 1	27	0	100
Baseline 2	9	0	100
Baseline 3[a]	68	1	98.53*
Baseline 4[a]	28	0	100
Asking "How are you?"			
Baseline 1	3	3	0
Baseline 2	2	2	0
Baseline 3[a]	7	7	0
Baseline 4[a]	12	12	0

Note: *Figure rounded up to the nearest .01%; **Conversation initiated that is not related to other variables; [a]Data collected during the intervention phase of another social behaviour.

Table 3 depicts the frequency and percentage of four observed social behaviours displayed by Finn. Based on Table 3, Finn was able to initiate conversations well. He has initiated conversations whenever he has the opportunity to across the three baseline sessions. His behaviour only slightly decreased during the fourth baseline session.

Finn was also able to respond to others in a conversation quite consistently, where he responded to others >98% of the time during across four sessions. Data for 'Introducing Self' shows that Finn was able to introduce himself to a new person during baseline 1 but failed to do so during baseline 4.

Table 3 revealed that Finn scored the lowest for 'Asking "How are you"'. Despite having many opportunities across all 4 baselines, he did not exhibit that specific social

behaviour. He also did not consistently greet others. Although he greeted people 100% of the time during baseline 1, however, he did not greet anyone he met during baseline 2. He only greeted people he met 28.57% of the time during baseline 3.

Table 4

Finn's Frequency of Social Behaviour Exhibited during Baseline.

Social behaviour	Frequency of behaviour
Asking about others' interest	
Baseline 1	0
Baseline 2	0
Intervention 1	4
Intervention 2	1
Asking for help	
Baseline 1	1
Baseline 2	1
Baseline 3[a]	2
Baseline 4[a]	1

Note: [a]Data collected during the intervention phase of another social behaviour.

Table 4 depicts the frequency of the remaining 2 social behaviours by Finn. Since missed opportunities for these 2 behaviours were not taken and therefore, their percentage of behaviour occurred are not calculated. Based on table 4, Finn was able to ask for help when he needed to. Also based on table 4, Finn did not show any interest in asking about others' interest.

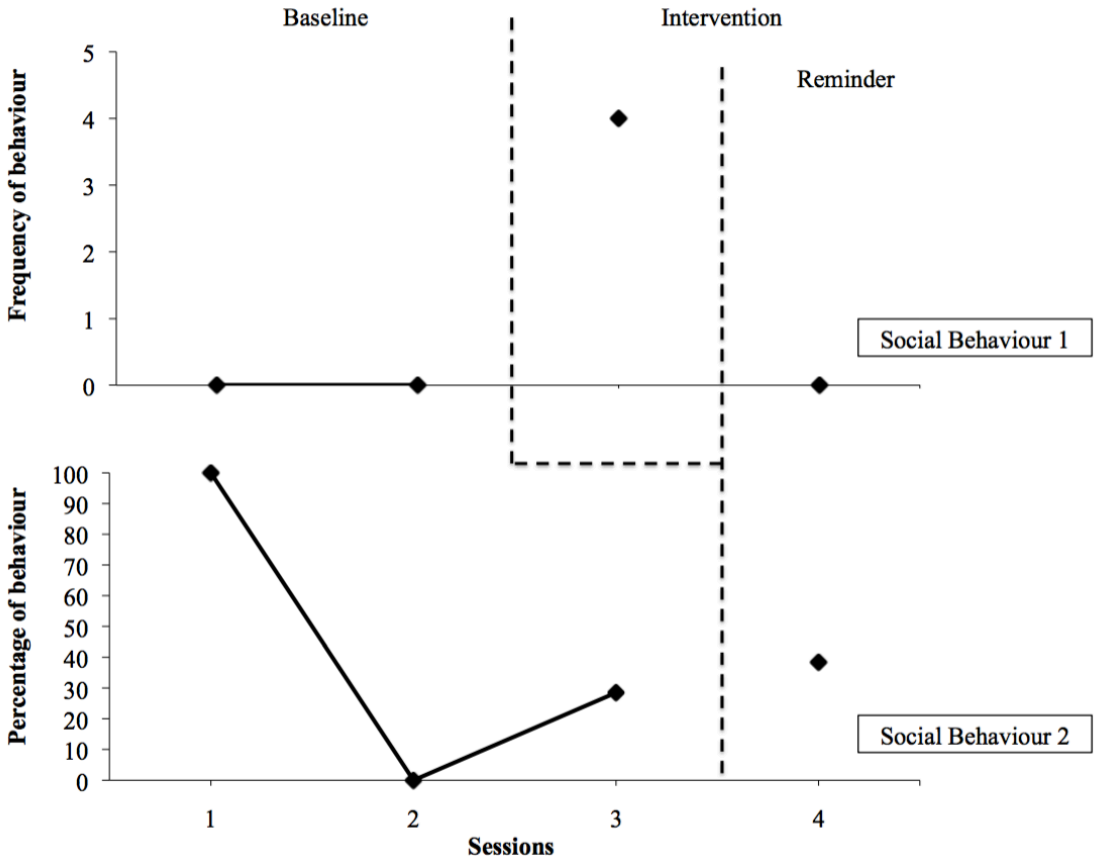

Figure 2: Frequency of social behaviour 1 (Asking about others' interest) and percentage of social behaviour 2 (Greeting others) across 4 sessions for Finn.

Figure 2 depicts the baseline and intervention for two targeted social behaviours for Finn. There was a sharp increase (from 0 times to 4 times) in social behaviour 1 (asking about others' interest) during intervention.

A new video ('greeting others') was given to Finn for intervention 2. After giving Finn the second video for intervention 2, a reminder was sent out every day to remind him to watch both videos. According to figure 2, there was only a slight increase in Finn's social behaviour 2 during intervention 2 and there was a sharp decline in social behaviour 1 during intervention 2.

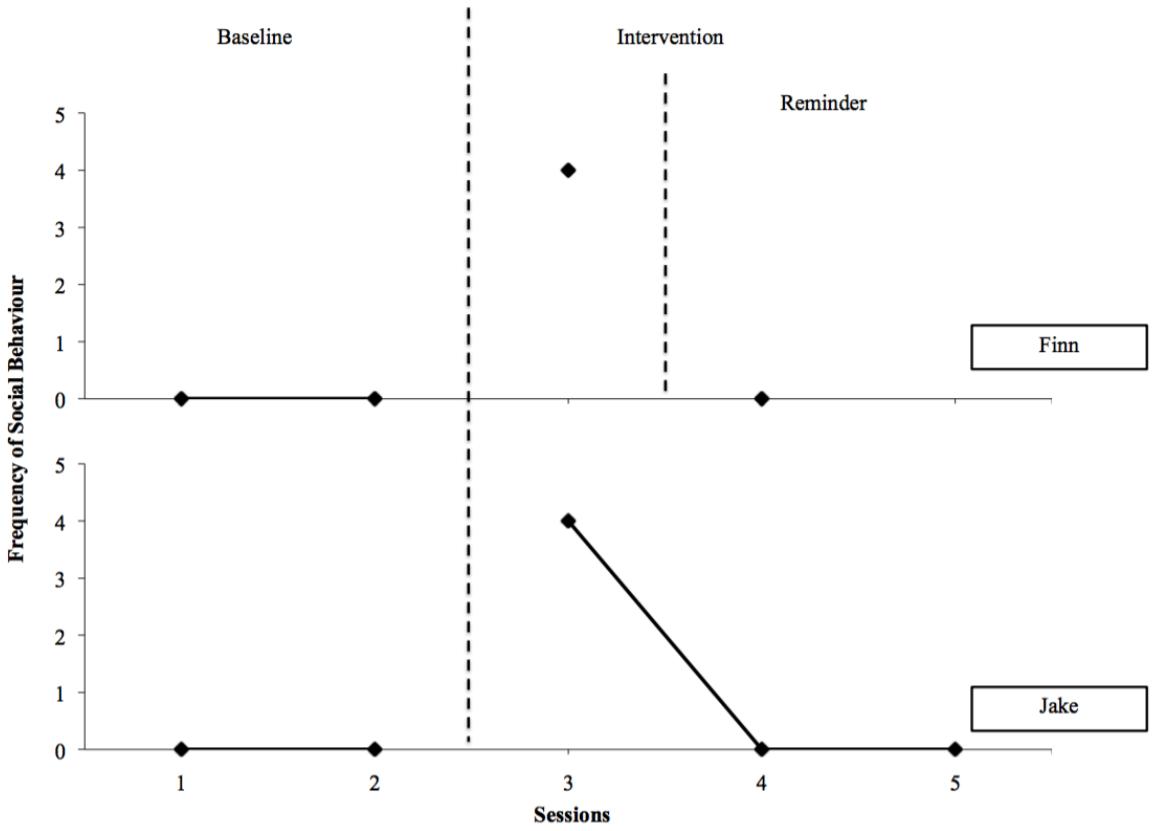

Figure 3: Frequency of social behaviour 1 (Asking about others' interest) during baseline and intervention for Finn and Jake.

Figure 3 depict the frequency of Finn and Jake's social behaviour on 'asking about others' interest). According to the figure, both participants did not display the targeted behaviour during baseline, however, their behaviours sharply increased during intervention. Although a daily reminder sent to Finn before the 4th session seems to have a negative effect his behaviour where his behaviour declined sharply, but Jake's behaviour also declined sharply even without a reminder. Jake's behaviour remained at 0% during session 5.

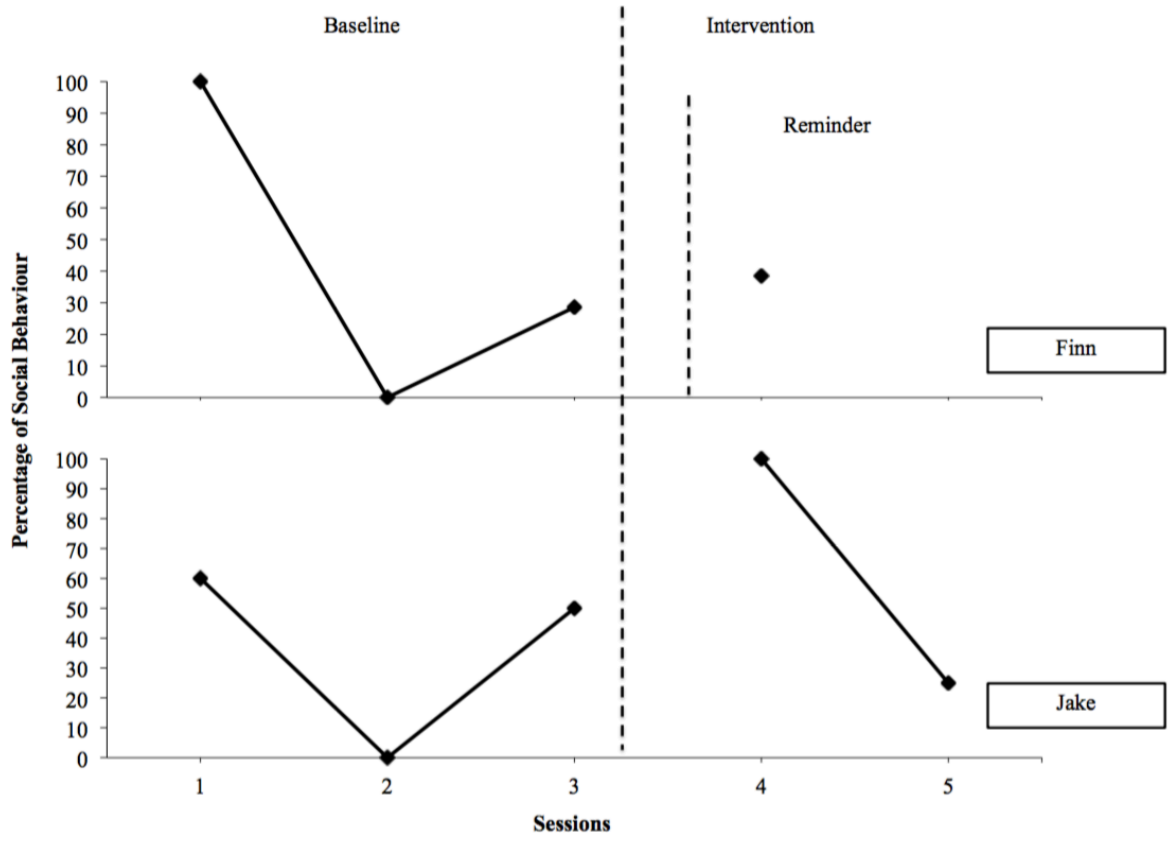

Figure 4: Percentage of social behaviour 2 (Greeting others) during baseline and intervention for Finn and Jake.

Figure 4 depict the frequency of Finn and Jake's social behaviour on 'greeting others'. According to the figure, both participants displayed the targeted behaviour during the first session (baseline 1) but their behaviours sharply increased during the second session (baseline 2). During the third session however, there was an increase in 'greeting others' behaviour and baseline for this social behaviour was taken simultaneously with an intervention of another social behaviour (asking about others' interest). It seems like the intervention of the first behaviour (asking about other's interest) had an effect on this current behaviour (greeting others), as seen in both figure 1 and figure 2.

Percentage of Finn greeting others increased slightly during intervention (session 4) while Jake's behaviour increased sharply. Jake's social behaviour of 'greeting others'

declined during the fifth session, where the third intervention was included. decreased after being introduced with a new video for another targeted social behaviour.

Chapter 4:
Discussion

This study explored the effects of VM on social behaviour for adults with ASD and ID in an employment setting. The results of this study show that VM did have an influence on social skills for two adults with ASD and ID in an employment setting. However, overall the results are inconclusive due to insufficient data points.

This study revealed that VM had increased social initiation (greeting others) where both participants showed an immediate increase of the behaviour during intervention. However, the behaviour did not maintain when a new social behaviour intervention was introduced. This pattern of immediate increase, followed by a drop in behaviour is consistent with the results from a social skills study by Alzyoudi et al. (2015) and Kabashi and Epstein (2017).

It is also crucial to note that the intervention period for both studies by Alzyoudi et al. (2015) and Kabashi and Epstein (2017) occurred for a longer period of time. With that extended time, there was an increase of greeting and social initiation behaviours in their participants after a few intervention sessions and the participants were able to consistently greet others. Therefore, the decline in behaviour for Finn and Jake could be just be initial drop and there is a possibility of them increasing in the targeted behaviour (greeting) if intervention was provided for a longer period of time. In addition to that, their chances of aquiring targeted skills as well as to generalise them is much higher if they had more time to practice (Ogilvie, 2011).

Individuals with ASD often struggle with social initiation and this carries on to adulthood (as cited in R. L. Koegel, Bradshaw, Ashbaugh, & Koegel, 2014). Kabashi and Kaczmarek (2017) also stated that due to the challenge, individuals with ASD usually require

additional interventions for social initiation. Therefore, this also suggests that if Finn and Jake had more opportunities to watch the videos, it would have increased their opportunity to acquire and maintain the greeting behaviour.

Past studies also showed that VM can be generalised across stimuli (Nikopoulos, 2007; Nikopoulos, Canavan, & Nikopoulou-Smyrni, 2009; Nikopoulos & Keenan, 2004b). Based on the result during session 3, social behaviour for 'greeting others' increased concurrent with social behaviour for 'asking about others' interest' during the first intervention. Interestingly, the participants were only given the video clip for the latter behaviour and not for the former. This seems to indicate that the intervention for 'asking about others' interest' can be generalised across another behaviour. This may also occur due to participant needing to greet another person before starting a conversation with them.

Intervention 3 (asking "how are you?") was only given to Jake. There were no changes throughout baseline and intervention. Since intervention for this behaviour was only conducted over one session, the results do not accurately reflect on the efficacy of VM on that behaviour. However, given that he did exhibit an immediate increase of the first two social behaviours, the possible reason why Jake did not exhibit the 'asking "how are you?"' social behavior is unknown.

There are two possible explanations for Jake's failure to imitate 'asking "how are you?"'. They are: the possibility of him having a delay in acquiring that skill and the failure to generalise behaviour across settings. According to De Bildt et al. (2005), individuals with ID experience a delay in acquiring basic social skills.

A study by Hepting and Goildstein (1996) revealed that their participants were able to practice observed skills immediately after watching a video of a targeted behaviour, however, they were not able to maintain the behaviour after a while and in a different setting. They also

noted that there may be a possibility that the participants lacked the ability to generalise targeted behaviour across different settings. The researchers suggested, for future studies to design videos for modelling that replicate the setting of where the targeted behaviour should occur, to eliminate the issue with generalisation across settings. The same could be applied to Jake. If the issue of generalising across settings, and possibly across people too, is eliminated, he may be able to learn that skill better. Alternatively, Jake could be taught to imitate targeted skills and then have another intervention for generalisation targeted skills across settings and people after he had acquired the skills to imitate.

The overall results for Jake showed that he seems to have trouble with manding. According to Skinner in 1957, manding behaviour is the most prominent deficit among individuals with ASD and it is often very obvious (as cited in Weiss, 2001), although Jake was diagnosed with ID, it is still possible for him to have a deficit in his manding repertoire. Manding is a type of verbal behaviour that is governed by the motivating operations of a person to achieve a specific reinforcement where the mand itself will determine the reinforcer (Lamarre & Holland, 1985). Interventions that help Jake to increase his manding behaviour may be beneficial for him to increase his verbal behaviour repertoire and to help him imitate the videos better.

Limitations

There are many limitations to this study. One of the major limitations for this study was time. A lot of time was taken up by recruiting participants due to multiple unforeseen setbacks. One of the most significant setbacks was due to a major change within the organisation. Due to this delay, and the fact that the participants only worked once a week, there was insufficient time and opportunity for researchers to collect more data, especially for intervention data of targeted behaviours. Therefore, this study cannot make a sound

conclusion for VM intervention on social skills. In addition to that, maintenance of the targeted social behaviour was not investigated, also due to the time constraint.

Another limitation to this study was the time allocated for participants to watch the modelling videos before an observation. Meta-analysis conducted by Bellini and Akullian (2007) revealed that the average intervention sessions for VM was nine and a half sessions, with the average of three minutes per video. Participants in this study had a minimum of four days to watch the new video along with the video from the previous week. This may indicate that due to the insufficient sessions for the participants to learn skills from the video, the data collected is inconclusive. In addition to that, the duration of the videos for this study was on the average 15 seconds instead of three minutes.

Even though participants were told to watch the videos every day, because no treatment integrity data was collected, researchers cannot be sure that the participants continued to watch the videos throughout intervention. Even though a daily reminder was given to one of the participants during his second intervention, it is still unknown if the reminders helped the participant to remember to watch the videos or not.

Another limitation for this study is its research design. Since this is a single case experimental study, there is a limitation in terms of the external validity of this study. A systematic replication of studies that uses this design should take place in order to assess the validity of this method for the group (individuals with ASD and ID). In addition to that, without an experimental control, researchers cannot conclude that the intervention was responsible for any changes observed in the behaviour of the participants.

Ideally, this study should also have more data points in each phase, and at least three phases (an A-B-A withdrawal design; baseline-intervention-withdrawal) to offer more conclusive results. Furthermore, social validity data should also have been collected to ensure

that the social significance of the goal, social appropriateness of the study and the social importance of the effects were met.

Moreover, due to the insufficient data points for baseline and intervention, the usual assumptions upon which single case experimental designs is based (repeated measures resulting in the participant being their own control, and the elements of baseline logic) is compromised. This design does not control for variability such as the participants having a bad day or week. The collected data may not be representative of their average behaviour. If more data points were collected, an average pattern could be identified and therefore, data collected will be more representative of the average behaviour of that participant.

Besides that, even though IOA data was collected for 30% of the observations, there is still a possibility of human error or researcher bias that affects the generalizability of this study over remaining 70% of observations.

Future Directions

This study has highlighted the possible impact of having a short intervention period on the outcome of individuals' behaviour. Future studies should aim to have a longer intervention period to ensure that participants have the opportunity to consolidate what they have learnt.

In addition to that, due to the lack of studies, future studies should also aim to further investigate VM and social skills adult participants, especially in regard to employment. This would benefit many individuals with a disability who want to participate employment.

Conclusion

This study does not have sufficient data points and baseline and intervention phases to demonstrate the efficacy of VM as a social skills intervention for individuals with ASD and

ID. However, it is still worthy for future exploration within the subject. This study can be viewed as a pilot study and be used as a reference for future studies.

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Appendices

Appendix A

Appendix B

Participant Information Sheet

School of Psychology

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

The purpose of this research

- To help adults with Autism Spectrum Disorder, Aspergers or Intellectual Disability starting in the [redacted] programme to learn some social skills they can utilise while at work, and to possibly help reduce anxiety before the first day of work.

Who is associated with the research?

- [redacted] (researcher)
- [redacted] (researcher)
- [redacted] (supervisor)
- [redacted] (employment supervisor)

How to contact the researchers and supervisors

[redacted]

[redacted]

What's involved for participants

- You will be asked to complete an initial meeting with one of the researchers at [redacted] to discuss the research and ensure you understand. This is expected to take no longer than 1 hour. All meetings after this can be completed at a location of your choice (e.g. [redacted] office, your home, somewhere else). After this meeting you will be asked to decide if you want to participate in the study or not.

- After the initial meeting, you will meet with a researcher again to complete an anxiety measure, to find out how anxious you are about starting work. This will take 5-10 minutes and means you will answer some questions about how you are feeling. After this, you will be invited to ask any questions you may have.

- You will be given a video showing some social skills to practice before you start work, you will be asked to watch this every day at home, including on the morning before you start work. The video will be no longer than 5 minutes.

- You MAY also be provided with a video showing what will happen on the first day of work, specifically going to the meeting place and travelling to work. Again, you will be asked to watch this a minimum of 3 times or maximum of once per day at home, including on the morning before you start work. The video will be no longer than 3 minutes.

- On the morning of starting work, you will be asked to meet the researcher and will again answer questions about how anxious you are. You will be asked a couple of questions about how you feel about starting work.

- Researcher will be observing you in the morning (on your working days only) while you do your own thing.

What will happen to the information we collect?

- Any information you give us will be stored securely by the researchers, on a laptop which is password protected.

- We will use this information to write a report for our master's thesis. This report will then be published on the Waikato University website. There will be no personal information used in the report which may identify you, e.g. your name will not be used. Information that will be published in the report may include your age, gender and diagnosis only.

- The [redacted] employment team will be provided with general information about how the study has helped participants, and whether any of the changes we have put in place have helped to reduce people's anxiety or increase social behaviours. This will be given directly to [redacted] (employment manager) but will not include information about who was involved in the study, and what support they received during this time.

- If you would like information about what we found out in this study and any findings about you, we can share this with you at the end of the study. We can only do this once we have finished all our work on this project. If you would like to get this information, please email us or tell us, and we will make sure you get this when the study is completed.

By agreeing to be involved in this study, you confirm you are happy with your information being used as explained above.

How to opt out of this study?

- You can stop being part of this study anytime until we have collected all data.
- To stop being a part of this study, please tell the researcher by text, phone, email or in person, or tell [redacted]

How to get more information:

- If you want any more information or have any questions about this study, please email me on the above email and I will respond as soon as I am able to.

This research project has been approved by the Human Research Ethics Committee (Health) of the University of Waikato under HREC(Health)2019#44. Any questions about the ethical conduct of this research may be addressed to the Secretary of the Committee, email humanethics@waikato.ac.nz, postal address, University of Waikato, Te Whare Wananga o Waikato, Private Bag 3105, Hamilton 3240.

Appendix C

Consent Form for Participants

I have read the **Information Sheet for Participants** for this study and have had the details of the study explained to me. My questions about the study have been answered to my satisfaction, and I understand that I may ask further questions at any time.

I also understand that I am free to withdraw from the study until the time where all data has been collected, or to decline to answer any particular questions in the study. I agree to provide information to the researchers under the conditions of confidentiality set out on the Information Sheet.

ϒ I agree for this interview to be audio recorded

ϒ I agree to participate in this study under the conditions set out in the Information Sheet form.

Signed: _____

Name: _____

Date: _____

Parent Signed:
(if applicable) _____

Name: _____

Date: _____

Researcher's Name and contact information:

Supervisor's Name and contact information:

Appendix D

Data Collection Sheet

Participant Initials:		Observer Initials:		Date:		Intervention: Baseline / Intervention / Maintainance					
	Observation #1		Observation #2		Observation #3		Observation #4		Observation #5		Observation #6	
	Tally		Tally		Tally							
Greeting others	M/O:		M/O:		M/O:		M/O:		M/O:		M/O:	
Introducing self	M/O:		M/O:		M/O:		M/O:		M/O:		M/O:	
Asking about others interests												
Initiating conversation (Unrelated to other catogeries)	M/O:		M/O:		M/O:		M/O:		M/O:		M/O:	
Responding to others	M/O:		M/O:		M/O:		M/O:		M/O:		M/O:	
Asking "how are you?"	M/O:		M/O:		M/O:		M/O:		M/O:		M/O:	
Asking for help												

Note: M/O: Missed Oppourtunities