# Comparison of Prompting Procedures to Teach Internet and Information and Communications Technology to Older Adults

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Abstract

Internet use has been found to produce meaningful social interactions and greater social support among older adults (White et al., 2002). The Internet and related information and communications technologies (ICTs) has the potential to serve as an excellent communication tool for older adults, as it allows individuals to stay in touch with family and friends and may even help to expand one's social network (Gato & Tak, 2008). Despite these benefits, the Internet and ICTs are not widely used among the older-adult population (Cresci, Yarandi, & Morrel, 2010). With continuous technological advancements, and a growing population of older adults, there is an increased demand for effective ICT-training programs geared specifically toward older adults (Mayhorn, Stronge, McLaughlin, & Rogers, 2004). The current study utilized an adapted alternating treatments design to compare the effectiveness and efficiency of video prompting and text-based instructions on the acquisition of three tablet-based tasks: emailing, video calling (FaceTime® application), and searching for a YouTube™ video. Video prompting and text-based instructions were both effective for all three participants, with both prompting procedures being roughly equivalent in terms of efficiency for two of three participants and video prompting being more efficient than text-based instructions for the third participant. Results are discussed in the context of potential limitations and areas for future research.

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# Comparison of Prompting Procedures to Teach Internet and Related Information Communication Technology Skills to Older Adults

The Internet and the application of information and communications technologies (ICTs) has significantly advanced over time (Struve & Wandke, 2009; Wagner, Hassanein, & Head, 2010). As such, ICTs are becoming pervasive in all areas of life, such as education, work, and daily activities (Struve & Wandke, 2009). ICTs include any computer-based device or application used for communication and information purposes, such as Internet-connected computers or tablets (e.g., iPads®), mobile communication devices (e.g., smartphones), and social media applications (e.g., e-mail, video calling or conferencing, Facebook™; Berkowsky et al., 2013; Woodward et al., 2011). These Internet-based technologies are used for a variety of purposes, including business (Charness & Boot, 2009), communication (Wagner et al., 2010), leisure (Charness & Boot, 2009; Wagner et al., 2010), e-commerce (e.g. online banking, online shopping; Wagner et al., 2010), and telehealth (Charness & Boot, 2009; Morrell, Mayhorn, & Bennett, 2000; Wagner et al., 2010). As the Internet and ICTs continue to expand and change over time, use and mastery of applications often becomes a difficult task for older adults (Heaggans, 2012).

## Older Adults and Information and Communication Technologies

A digital divide appears to exist among older adults (commonly referred to as the "grey" digital divide), in which there is a distinct age difference between Internet and ICT users and non-users (Cresci et al., 2010; Millward, 2003; Morrell et al., 2000; Morris & Brading, 2007; Morris, Goodman, & Brading, 2007). That is, older adults (i.e. individuals 65 years and older) are less likely to use the Internet and ICTs than younger individuals. In fact, older adults make up only a small proportion of those online (Morell et al., 2000; Morris & Brading, 2007; Morris et al., 2007). -According to the Canadian Internet Use Survey, as of 2012, only 47.5 % of individuals aged 65 years and over report using the Internet. This is a stark contrast to the 92.6% of individuals aged 16 to 64 who report using the Internet (Canadian Internet Use Survey, 2012). A similar trend in the percentage of individuals aged 65 years and over who report using the Internet was also observed in the United States. Specifically, in 2012, 54% of older adults reported using the Internet and 89% of individuals between the ages of 18 to 64 reported using the Internet (Perrin & Duggan, 2015). Although Internet use is lower among older adults compared to younger populations, older adults currently make up the fastest growing population of Internet users (Cresci et al., 2010; Mayhorn et al., 2004). Despite this fact, the Internet and ICTs are continuously advancing and changing, which may make it difficult for both current and future generations of older adults to keep pace with these advancements (Heagans, 2012). As a result, the continuous advancements in the Internet and ICTs may in turn, widen the digital divide.

The digital divide for older adults is of increasing concern as (a) reliance on technology becomes more prominent in society, (b) the population of older adults continues to increase (Warren-Peace, Parrish, Peace, & Xu, 2008), and (c) the Internet and ICTs continue to advance. Older adults make up the fastest-growing age group in Canada ("Population Projections: Canada, the provinces and territories, 2013 to 2063", 2014) and in the United States (Mather, Jacobsen, & Pollard, 2015). As of 2015, older adults were estimated to make up 16.1% of the Canadian population ("Canada's Population Estimates: Age and sex, July 1, 2015", 2015). This percentage is expected to increase to approximately 22% by 2030, meaning that close to one in four individuals in Canada will be 65 years or older by 2030 ("Population Projections: Canada, the provinces and territories, 2013 to 2063"). Similarly, In the United States, older adults made up 15% of the total population in 2015 and are expected to make up 21% of the total population by the year 2030 (Mather et al., 2015). With continuous technological advancements and a growing population of older adults, there is an increased demand for effective ICT-training programs geared specifically toward older adults (Mayhorn et al., 2004). However, in order to maximize their effectiveness, ICT-training programs must first address the misconceptions, barriers, and health-related challenges often experienced by older adults when learning to use these technologies (Heaggans, 2012).

Older adults are often faced with several misconceptions and barriers that may influence their use (or lack thereof) of the Internet and ICTs. In addition, the majority of today's older adults grew up during a time when the Internet and ICTs did not yet exist (or were not common household items) and may therefore be unfamiliar with current technologies and their applications (Heaggans, 2012). As a result, some older adults have been found to have a lack of interest toward these technologies (Cresci et al., 2010). In addition, many older adults have the misconception that the Internet and ICTs are too complex to use or are unsuitable for older adults (Berkowsky et al., 2013; Carpenter & Buday, 2007; Morris et al., 2007). Further, older adults have expressed concerns regarding Internet safety and privacy, which may also inhibit their use of the Internet and ICTs (Cresci et al., 2010). A possible barrier to Internet and ICT use may be income and education. For example, several researchers have found that older adults with lower income and education are less likely to use the Internet and computers than older adults with higher income and education (Cresci et al., 2010; Morris & Brading, 2007; Woodward et al., 2011). Collectively, these misconceptions and barriers may prevent the widespread use of the Internet and ICTs among the older adult population. Therefore, interventions designed to increase Internet and ICT use among older adults should address these misconceptions and barriers.

In addition to these misconceptions and potential barriers, older adults may experience health decline (e.g., physical and cognitive decline) that may limit their ability to effectively use the Internet and ICTs (Carpenter & Buday, 2007; Morris & Brading, 2007; Wagner et al., 2010). It is important to note that both cognitive decline (e.g., memory loss, difficulties attending) and physical decline (e.g., declining eye sight, reduced colour sensitivity, hearing loss, decline of fine motor skills) may contribute to difficulties in learning new skills for older adults (Berkowsky et al., 2013; Charness & Holley, 2004; Morris & Brading, 2007). In addition to physical and cognitive decline, health problems such as arthritis, dementia, hypertension, and Parkinson's disease also become more common with age and may further contribute to the lower levels of Internet use in older adults compared to younger adults (Morris & Brading, 2007). Aging and its associated health problems may make learning to use the Internet and ICTs a daunting and difficult task for older adults that may reduce the likelihood that they will use the Internet and ICTs despite their increasing prevalence in today's society.

Although there are numerous potential barriers, misconceptions, and health-related challenges that may interfere with older adults learning to use the Internet and ICTs, these technologies can offer several opportunities and benefits that may be particularly relevant for older adults. That is, the Internet and ICTs can provide older adults with numerous opportunities for social interaction and communication with others (Carpenter & Buday, 2007; White et al., 1999), health management (Charness & Boot, 2009; Morrell et al., 2000; Slegers et al., 2008; White et al., 2002), and entertainment (i.e., games, music, videos; Carpenter & Buday 2007; Slegers et al., 2008). In addition, Internet and ICT use may also result in decreased feelings of loneliness (Berkowsky et al., 2013; Shapira et al., 2007; White et al., 2002; White et al., 1999), decreased depression (Berkowsky et al., 2013; Shapira et al., 2013; White et al., 2002), and feelings of independence (Berkowsky et al. 2013; Morrel et al., 2000; Shapira et al., 2013). Collectively, these opportunities and benefits may enhance older adults' quality of life. Although some older adults report that the Internet and ICTs are too difficult to use and may not be appropriate for older adults (Berkowsky et al., 2013; Carpenter & Buday, 2007; Morris et al., 2007), the vast number of social and health benefits associated with Internet and ICT use may outweigh these perceived challenges and concerns.

Because older adults commonly experience social isolation (Praderas & MacDonald, 1986), the enhanced social interaction and communication experienced as a function of increased Internet and ICT use appears to be one of the most important social benefits for older adults, especially for those residing in nursing homes (Gato & Tak, 2008; Praderas & MacDonald, 1986). This is particularly true given that social isolation has been reported to contribute to feelings of depression as well as reductions in life satisfaction (Praderas & MacDonald, 1986). According to Heo et al. (2015), Internet use is a strong predictor of reduced loneliness and social isolation and is therefore associated with better ratings of life satisfaction and well-being. Therefore, Internet and ICT use appears to have the potential to mitigate or even prevent social isolation among older adults. In fact, older adults who currently use the Internet and ICTs have reported using these technologies mainly for the purposes of social interaction and communication (Gatto & Tak, 2008). Importantly, these older adults reported a greater ability to form and maintain relationships with friends and family by using the Internet (Gatto & Tak, 2008). For example, e-mail correspondence provided these older adults with the opportunity to keep in touch with friends and family as well as reconnect with or make new friends (Gatto & Tak, 2008). Further, older adults who regularly use the Internet have reported experiencing enhanced and more meaningful social interactions and greater social support from others (White et al., 1999; Woodward et al., 2011). Applications of ICTs such as email, instant-messaging, video-calling, and social media (e.g., Facebook™) can provide users with the opportunity to connect with others, both directly and indirectly, and are particularly relevant in promoting social interaction and communication. Therefore, it seems particularly prudent to teach older adults how to effectively use these applications to maximize their benefits.

Several efforts have recently been made to decrease the digital divide by teaching older adults how to use the Internet and related ICTs through various training programs (Antharat et al., 2014; Berger et al., 2012; Berkowsky et al., 2013; Czaja, 1997; Heaggans, 2012; Jones & Bayen, 1998; Mayhorn et al., 2004; Woodward et al., 2011; Woodward et al., 2013). In addition, more recent training strategies designed to teach Internet and related ICT skills to older adults have been designed to accommodate and account for the specific needs and preferences of these learners (e.g., increased font size and enlarged keyboards, supplementary handouts, and one-to-one assistance; Berkowsky et al., 2013; Woodward et al., 2011). For example, Berkowsky et al. (2013) designed an eight-week ICT-training program tailored specifically to the needs of older-adult learners. As such, computers were modified to have a higher resolution and increased font size to accommodate those with diminished eye sight. Furthermore, enlarged keyboards and trackball mice were provided for those with difficulties controlling their hand movements (Berkowsky et al., 2013). A manual was also used to supplement training and material was presented at a reduced pace and an increased volume (Berkowsky et al., 2013). Different types of modifications were evaluated by Woodward et al. (2011) For example, these investigators designed an ICT-training program for older adults that offered hands on learning and opportunities for supervised practice, one-to-one assistance, and step-by-step handouts for participants to take home and practice. Participants in both studies were successful in learning to use ICTs and responded positively towards their respective ICT-training programs and ICT use following completion of each study (Berkowsky et al., 2013; Woodward et al., 2011). Taken together, these studies demonstrate that with appropriate education and training that addresses the specific needs and preferences of older adults, these learners can overcome the misconceptions and barriers often associated with Internet and ICT use (Carpenter & Buday, 2007).

## Older-adult education

Many older adults report a desire to gain knowledge, learn interesting facts, and contribute to society (Phipps et al., 2013). As such, there have been significant developments in older-adult education (Krajnc, 2012; Phipps et al.). In fact, researchers are beginning to focus on suitable forms of education (i.e., instructional design or teaching methods) for older-adult learners (Phipps et al., 2013). Common forms of education for older-adult learners include classroom-based (group) instruction (Krajnc, 2012; Lee, 2015; Morris & Ballard, 2003) and independent learning (Krajnc, 2012; Morris & Ballard, 2003). Classroom-based (group) instruction is a form of education, in which an instructor presents a lecture to, and supports, a group of students within a classroom setting. Group instruction is a traditional form of education that is used for teaching learners of all ages, including older adults (Lee, 2015; Morris & Ballard, 2003; Kleitsch et al., 1983). Despite its continued use as an instructional method, Morris and Ballard (2003) reported that older adults do not find group instruction as useful as other instructional methods, such as independent education. This may be a result of older adults feeling intimidated or uncomfortable with learning a novel skill in a group setting or due to misconceptions about group education being a form of therapy (Morris & Ballard, 2003).

Independent education has become an increasingly popular method of instruction and is considered widely accepted by older-adult learners (Krajnc, 2012; Morris & Ballard, 2003). Independent education includes the independent use of instructional strategies such as print material (i.e., books, newsletters, etc.) and videos (Morris & Ballard, 2003) for learning purposes. Older adults have reported that these instructional strategies are useful because they can be reviewed at their own pace (Morris & Ballard, 2003). Mentoring is another form of independent education, in which the learner learns side-by-side with a mentor (otherwise known as pair-learning; Krajnc, 2012). Mentoring provides older adults with individualized learning opportunities and helps to address the specific needs and challenges of the learner (Krajnc, 2012). Independently used instructional strategies are commonly used by older adults when learning new skills as they offer a more self-paced and individualized learning environment than does group instruction. For this reason, independent education is becoming more widely accepted by older adults (Krajnc, 2012; Morris & Ballard, 2003).

As the population of older adults continues to expand, more efforts are being made to teach older adults skills that will benefit their well-being and support their unique needs (Lee, 2015). As such, older-adult education often focuses on the development of safety and health-related skills, such as how to operate assistive technologies such as wheelchairs (Griesbrecht et al., 2015), how to maintain good health with nutrition classes (Higgins & Barkley, 2004), and how to perform exercises (Silveria et al., 2013). In addition, older-adult education provides opportunities for leisure and entertainment such as art classes (La Port, 2015) and ICT-training programs (Antharat et al., 2014; Berger & Croll, 2012; Berkowsky et al., 2013; Mayhorn et al., 2004; Struve & Wandke, 2009; Woodward et al., 2011). Like other leisure activities, the internet and ICTs are becoming an increasingly popular topic of interest in older-adult education due to its widespread prevalence and potential benefits for older-adult users (Berkowsky et al., 2013; White et al., 1999). In fact, several studies have employed both group and independent forms of education to teach older adults to use the Internet and ICTs (e.g., Antharat et al., 2014; Berger & Croll, 2012; Berkowsky et al., 2013; Mayhorn et al., 2004; Struve & Wandke, 2009; Woodward et al., 2011). Despite the current applications of older-adult education for ICT training, this topic is not widely researched within behaviour analytic literature.

**Older-adult Education and Behaviour Analysis**

Older-adult education is becoming an increasingly popular area of research and behaviour analytic instructional methods have the potential to contribute to this line of research in several meaningful ways (Gallagher & Keenan, 2006). Behaviour analytic instructional methods are derived from the science of behaviour, which is a comprehensive scientific system dedicated to understanding the relationship between behaviour and the environment (Pierce & Chaney, 2013, pp. 37). Behaviour analytic instructional methods are particularly well suited for the study and design of older-adult education because they focus on changing socially significant behaviours in meaningful ways (Baer, Wolf, & Risley, 1968). In addition, they also allow for the reliable quantification of the learner's behaviour, such that any effects of instruction can be reliably and accurately measured (Baer et al., 1968). Behaviour analytic instructional methods also offer a technological description of instructional strategies in which all components are explicitly specified and defined so others can replicate the effects (Baer et al., 1968). Further, all behaviour analytic instructional methods are explained using principles that are derived from the science of behaviour so as to ensure that any instructional method used strictly adheres to the concepts and principles of the science of behaviour (Baer et al., 1968). Finally, behaviour analytic instructional practices are designed to be produce large and meaningful changes over time and in all relevant settings (Baer et al., 1968) As such, behaviour analytic instructional methods are ideal for the study and design of older-adult education.

Behaviour analytic principles can be applied in a wide variety of educational settings to teach new skills to individuals across the entire lifespan (Cooper et al., 2007, pp. 14). As with other populations, behavioural interventions that target the development of new skills can produce meaningful changes for older adults (Gallagher & Keenan, 2006; Williamson & Ascione, 1983). In fact, several researchers have evaluated the efficacy of behavioural methods of instruction to teach a variety of new skills to older adults. These instructional methods include token reinforcement systems (Libb & Clemmens, 1969), response prompts plus reinforcement (Praderas & MacDonald, 1986), and video modeling and guided-error training (Struve & Wandke, 2009). Behaviour analytic instructional methods can be applied to older adult education to identify appropriate and effective teaching methods for older adults, and more specifically, to teach Internet and ICT use to older adults. Because the current experiment uses a combination of chaining and prompting procedures to teach ICT use, the following two sections will review chaining and prompting procedures in more detail.

**Chaining procedures.** Chaining is a behaviour analytic instructional method that is used to teach new behaviour chains. Cooper et al. (2007) refer to a behaviour chain as “a specific sequence of discrete responses” (pp. 435). A behaviour chain links several responses together, all of which must occur in succession in order to reach the terminal outcome. With the exception of the first and last steps, each response in a behaviour chain produces a stimulus change that serves as a discriminative stimulus for the next response in the chain and a conditioned reinforcer for the previous response in the chain (Cooper et al., 2007, pp. 437). Prior to teaching a behaviour chain using chaining procedures, a task analysis (TA) must be developed in which the behaviour chain is broken down into smaller, more teachable units or steps (Cooper et al., pp. 437). In fact, this approach to teaching was suggested by Mayhorn et al. (2004) when teaching older adults to perform computer-related tasks.

Once a behaviour chain has been task analyzed, it can be taught using one of three different methods of chaining: forward chaining, backward chaining, or total-task chaining (Cooper et al., 2007, pp. 442-443). All three of these chaining procedures have been effectively used with multiple populations, including children and teenagers with developmental disabilities (e.g., DeQuinzio, Townsend, & Poulson, 2008; McDonnell & McFarland, 1988; Shrestha, Anderson, & Moore, 2012; Slocum & Tiger, 2011), adults with developmental disabilities (e.g., Jerome, Frantino, & Sturmey, 2007; Purrazzella & Mechling, 2013; Walls, Zane, & Ellis, 1981), and typically developing individuals (e.g., Smith, 1999; Weiss, 1978). In addition, these chaining procedures have been used to teach a wide variety of adaptive skills, such as social skills (DeQuinzio et al.), daily living and self-help skills (McDonnel & McFarland, 1988; Shrestha et al., 2012), academic skills (Purrazzella & Mechling, 2013), and vocational skills (Walls et al., 1981). Taken together, chaining procedures have been repeatedly demonstrated to effectively teach a wide variety of skills to diverse populations.

Forward chaining consists of teaching a behaviour chain in order, beginning with the first step of the TA and teaching each successive step until the entire behaviour chain has been learned (Cooper et al., 2007, pp. 442). To begin, only the first step of the TA is taught and the instructor completes all remaining steps. Once the first step has been learned, the instructor then teaches the learner how to perform the second step in the behaviour chain and completes all remaining steps of the TA (Cooper et al., 20017, pp. 442). This process continues until the learner has acquired all the steps in the behaviour chain. For example, if teaching a behaviour chain consisting of steps A, B, C, and D, the instructor would first teach step A. After step A is learned, the instructor would then teach step B, step C, then finally step D. A disadvantage of forward chaining is that the learner does not come into contact with the terminal reinforcer until he or she is on final step of the behaviour chain because each step of the behaviour chain is taught in succession (Cooper et al., 2007, pp. 442). Forward chaining, however, can be especially useful for teaching longer chains because they can easily be broken down into several smaller chains that can later be linked together (Cooper et al., 2007, pp. 442). Another advantage of forward chaining is that it is relatively easy for instructors to use given that the steps are taught in order and one at a time (Cooper et al., 2007, pp. 442).

Backward chaining consists of teaching a behaviour chain from the final step of the TA to the first step (Cooper et al., 2007, pp. 443). The instructor starts by completing all but the final step of the behaviour chain for the learner. Once the learner acquires the final step, the instructor then completes all but the last two steps of the behaviour chain. This process continues until all steps in the chain have been learned (Cooper et al., 2007, pp. 443; Slocum & Tiger, 2011). For example, if teaching a behaviour chain consisting of steps A, B, C, and D, the instructor would first teach D. After step D is learned, the instructor would then teach step C, step B, then finally step A. According to Cooper et al. (2007), backward chaining has an advantage over the other chaining methods because it allows the learner to come into contact with the terminal reinforcer on every instructional trial (pp. 446). Furthermore, McDonnel and Laughlin (1989) suggest that by limiting the number of “new steps” during instruction, backward chaining may reduce the number of errors the learner may make during an instructional trial. Despite these advantages, Cooper et al. noted that backward chaining might result in limited responding due to fact that the learner is not actively participating in the earlier steps in the chain.

Unlike forward and backward chaining procedures (in which you teach one step at a time), total task chaining (TTC) consists of teaching all steps of the TA during each instructional trial (Cooper et al., 2007; Smith, 1999; Walls et al., 1981). For example, if teaching a behaviour chain consisting of steps A, B, C, and D, TTC would involve teaching the entire sequence (i.e., ABCD) during each instructional trial. Because TTC involves teaching each step in the behaviour chain on each trial, the learner may be more likely to miss a step or perform a step out of sequence (Pear, 2001, pp. 240). Despite this disadvantage, TTC provides the most natural method of teaching behaviour chains because steps are taught sequentially and in the same order in which they would be encountered in the natural environment (McDonnel & Laughlin, 1989). Further, McDonnel and Laughlin (1989) stated that this method of chaining is more widely used in community settings and is a more normative method of instruction. TTC is particularly useful because it allows learners to acquire the steps at their own pace and does not limit them to learning only one step at a time (McDonnel & Laughlin, 1989).

Given the success of these chaining procedures in teaching a variety of skills across diverse populations, some researchers have attempted to compare the relative effectiveness and efficiency of these procedures to determine the most superior method of chaining (Hur & Osborne, 1993; McDonnell & Laughlin, 1989; Slocum & Tiger, 2011; Smith, 1999; Walls et al., 1981; Weiss, 1978). For example, Weiss (1978) compared forward and backward chaining procedures on the acquisition of response chains in 10 university students and found that forward chaining was superior to backward chaining for all participants (i.e., all 10 students made fewer errors with forward chaining). Weiss suggested that forward chaining might be superior to backward chaining because each response in a forward chain is directly reinforced, whereas in a backward chain, only the final response is reinforced. Despite this finding, the majority of studies comparing forward chaining and backward chaining have revealed no real differences between the efficiency of the procedures (Hur & Osborne, 1993; Slocum & Tiger, 2011; Walls et al., 1981).

Similarly, McDonnell, and Laughlin (1989) compared backward chaining and TTC to teach adults with developmental disabilities to purchase items at a fast food restaurant and a supermarket. Results from this study revealed no differences in the relative effectiveness of the two chaining procedures. That is, subjects successfully acquired the target tasks using both chaining procedures. Although a superior chaining procedure was not identified, these findings do suggest that TTC can be successfully used to teach skills in the natural environment with the same effectiveness as other chaining procedures (McDonnel & Laughlin, 1989). Smith (1999) went one step further and compared TTC, forward chaining, and backward chaining to teach a behaviour chain to college students. The author found that both TTC and forward chaining resulted in fewer errors than backward chaining when the behaviour chains were of equal and lesser difficulty. However, when the behaviour chains were of greater difficulty, backward and forward chaining were superior to TTC. Results from this experiment suggest that it may be useful to teach a *simple* behaviour chain in its natural order using TTC or forward chaining; however, more complex behaviour chains may be better suited to a backward chaining procedure. However, research comparing the efficiency of forward chaining, backward chaining, and TTC have been inconclusive (Cooper et al., 2007, pp. 446; Slocum & Tiger, 2011). That is, no clear pattern across studies have been observed that suggest the superiority of one method. It should also be noted that the acquisition of skills may be more dependent on the learner and the complexity and type of the behaviour chain being taught than the specific chaining procedure used (Pear, 2016, pp. 208; Slocum & Tiger, 2011). Therefore, when selecting a chaining procedure, one should consider individual characteristics, the complexity of the behaviour chain, and the nature of the behaviour chain itself.

The TTC procedure may be the most appropriate procedure to use when teaching older adults to use ICTs as it offers a naturalistic approach to teaching and allows learners to learn at their own pace (McDonnel & Laughlin, 1989). This is particularly pertinent given that previous researchers have found that teaching methods for older adults are more effective when older adults play an active role in planning the pace of their learning (du Plessis, Anstey, & Schlumpp, 2011). Further, numerous researchers have noted that older adults require additional time to practice Internet and ICT skills (du Plessis et al., 2011; Heaggans, 2012; Woodward et al., 2013); therefore, the fact that TTC allows learners to learn at their own pace makes it very well suited to teach older adults to learn Internet and ICT skills. As with any chaining procedure, the TA steps are typically taught using various methods of prompting. Therefore, in order to effectively teach older adults how to use the Internet and ICTs, TTC should be combined with appropriate prompting procedures.

**Prompting Procedures.** Prompting procedures are often used in conjunction with chaining procedures to enhance the effectiveness and efficiency of an instructional method (Cooper et al., 2007; Seaver & Bourret, 2014; Walls, 1985). Prompting represents a class of behaviour analytic instructional methods aimed at increasing the probability of a correct response (MacDuff, Krantz, & McClannahan, 2001; Miltenberger, 2016, pp. 215; Mosk & Bucher, 1984). More specifically, prompts (response prompts and stimulus prompts) are antecedent stimuli that control and cue a correct response (MacDuff et al., 2001; Miltenberger, 2016, pp. 215; Mosk & Bucher, 1984). A stimulus prompt (i.e., within-stimulus prompt) operates directly on the discriminative stimulus in order to evoke a correct response (Lorah et al., 2014). There are numerous types of stimulus prompts, including (a) movement prompts (e.g., tapping, touching, or looking at the stimuli; Cooper et al., 2007), (b) position cues (e.g., position stimuli closer to the learner; Cooper et al., 2007), and (d) redundancy cues (e.g., pairing an additional stimulus such as colour, size, or shape with the correct choice or stimulus; Cooper et al., 2007). To our knowledge, no studies have evaluated the use of stimulus prompts to teach older adult learners how to use the Internet and ICTs.

A response prompt (i.e., extra-stimulus prompt) is an additional programmed stimulus (in addition to the discriminative stimulus) that increases the probability of a correct response (Lorah et al., 2014; Schreibman, 1975; Taylor, Anderson, & Mudford, 2012). There are numerous types of response prompts, including: modeling (Burke et al., 2013; Cooper et al., 2007), textual prompts (MacDuff et al., 2001; Taylor et al., 2012), physical prompts (Cooper et al., 2007), gestural prompts (MacDuff et al., 2001), verbal prompts (Cooper et al., 2007), and pictoral prompts (MacDuff et al., 2001). The effectiveness of response prompts have been demonstrated across a diverse population, such as children with developmental disabilities (e.g., Blissett, Bennet, Fogel, Harris & Higgs, 2015; Hayess, 2013; Libby, Weiss, Bancroft, & Ahearn, 2008; MacDuff et al., 2001; Seaver & Bourret, 2014), adults with developmental disabilities (e.g., Burke et al., 2013; Mechling et al., 2014; Sigafoos et al., 2005), and typically developing populations (e.g., Taylor et al., 2012; Miljkovic, Kaminski, Yu, and Wishnowski, 2015). The effectiveness of different types of response prompts have also been demonstrated across a wide variety of skills, such as language acquisition and social skills (Miltenberger & Charlop, 2015), play skills (Libby et al., 2008; Miltenberger & Charlop, 2015), food acceptance (Blissett et al., 2015), vocational skills (Burke et al., 2013), and daily living skills (Mechling et al., 2014; Sigafoos et al., 2005). Despite the extensive research that has been done on various response prompts, no clear pattern has been observed across studies to suggest the superiority of one particular prompting procedure over others (Seaver & Bourret, 2014). Because the current experiment involved a comparison of a model prompt and a text-based prompt, the following section will review those prompting procedures and their variants in more detail.

***Modeling.*** Modeling is a type of prompting procedure in which an individual learns a skill by observing another individual demonstrate (model) the desired behaviour (Charlop-Christy, Le, & Freeman, 2000). From the perspective of the behaviour-change agent, modeling is easy to use, practical, and can be universally applied to all populations to teach a variety of skills (Cooper et al., 2007, pp. 402). Modeling consists of basic live (in-vivo) modeling (Charlop-Christy et al., 2000; MacDuff et al., 2001), video modeling (Garner & Wolfe, 2013), and video prompting (Gardner & Wolfe, 2013). Video modeling and video prompting are video-based instructional methods that provide learners with the opportunity to learn through observation of a video (opposed to a live demonstration; Hammond et al., 2010). In fact, video modeling and video prompting are often considered to be more effective and efficient than live modeling procedures (Allen et al., 2001; Charlop-Christy et al., 2000; Gardner & Wolfe, 2013). For example, several studies comparing video modeling and live modeling revealed that video modeling resulted in more rapid acquisition and greater generalization of skills compared to live modeling procedures (Allen et al., 2001; Charlop-Christy et al., 2000). Furthermore, video modeling and prompting procedures have been reported to be more systematic than live modeling (Charlop-Christy et al., 2000) and to provide learners with more consistent and focused instruction (Garner & Wolfe, 2013). As a result, video modeling and video prompting are becoming increasingly more popular and are often used over live modeling procedures.

Video modeling involves the target individual performing a specific task after watching an entire video of himself, herself, or others demonstrating how to perform a target task (Burke et al., 2013). Video models are usually enhanced to include voice-over instructions to increase the relative effectiveness of the teaching procedures; voice-over instructions consist of verbal descriptions for each step of the TA (Bennet, Gutierrez, & Honsberger, 2013; Burke et al., 2013; Mechling & Collins, 2012; Smith, et al., 2013). Video modeling procedures have been demonstrated to be effective across multiple populations including children and adolescents with developmental and intellectual disabilities (e.g., Hammond et al., 2010; Miltenberger & Charlop, 2015; Smith, Ayres, Mechling, & Smith, 2013; Van Laarhoven & Van Laarhoven-Meyers, 2006), adults with developmental and intellectual disabilities (e.g. Allen, Vatland, Bowen, and Burke, 2015; Mechling & Collins, 2012), typically developing adults (e.g., Lipschultz et al., 2015; Miljkovic et al., 2015; Rosales, Gongola, & Homlitas, 2015), and older adults (e.g., Struve & Wandke, 2009). Video modeling has been found to be effective in teaching a variety of skills and tasks, including: functional skills (e.g., cooking and preparing food, decorating a room, ordering food at a restaurant; Allen et al., 2015; Mechling & Collins, 2012; Smith et al., 2013), conversation and play skills (Miltenberger & Charlop, 2015), exercise (Silveira et al., 2013), how to conduct preference assessments (Lipschultz et al., 2015; Miljkovic et al., 2015; Rosales et al., 2015), how to operate a ticket vending machine (Struve & Wandke, 2009), and how to operate an iPod (Hammond et al., 2010). To our knowledge, no studies have evaluated the use of video modeling to teach older adults how to use the Internet and ICTs; however, a study conducted by Struve and Wandke (2009) demonstrated the effectiveness of video modeling (with guided error training) for teaching 20 older adults how to operate a ticket vending machines (TVMs). Although the authors did not collect a direct measure of participant performance, they found that participants reported an increase in procedural and structural knowledge related to TVMs following exposure to video modeling with guided error training. That is, participants reported that they were successful in applying the skills learned to operate TVMs and had a better understanding of the functionalities and structure of TVMs following the intervention (Struve & Wandke, 2009). These findings are promising as they seem to suggest that video modeling may be useful for teaching older adults to use other technologies such as the Internet and related ICTs.

Video prompting is a variant of video modeling in which the learner watches series of video segments one at a time for each TA step of the target task (as opposed to watching the entire video depicting all of the TA steps; Burke et al., 2013; Kellems & Edwards, 2016; Mechling et al., 2014). In video prompting, the learner first watches one video segment (i.e., one TA step) then performs that TA step. This pattern continues until all steps of the target task are completed (Burke et al., 2013; Kellems & Edwards, 2016; Mechling et al., 2014). Similar to video modeling, video prompting is often enhanced with voice-over instructions for each TA step (Burke et al., 2013). Video prompting has been effective in teaching a variety of functional skills to individuals with developmental and intellectual disabilities, including: daily living skills (e.g., Johnson, Blood, Freeman, & Simmons, 2013; Mechling et al., 2014; Perilli et al., 2013), vocational skills (e.g., Burke et al., 2013; Williams, 2013), sports and physical activity (e.g., Gies & Poretta, 2015; Lo, Burke, & Anderson, 2014), and Internet and ICT skills (e.g., Chan et al., 2013; Zisimopolous et al., 2011). Despite the widespread use of video prompting to teach various skills, the target audience for instruction of these skills consists primarily of individuals with developmental disabilities (Banda, Dogoe, & Matusnzy, 2011).

To date, very little research has been conducted on video prompting strategies to teach skills to older adults. In 2008, Mihailidis et al. used a reversal design to examine the effects of a video-prompting system referred to as *COACH* in teaching independent handwashing to six older adults with dementia. Results from this study revealed that video prompting improved mean level of participant performance and reduced the need for caregiver assistance (Mihailidis et al., 2008). A study conducted by Perilli et al. (2013) used an alternating treatments design to evaluate the effectiveness of video prompting compared to other strategies in teaching older adults with Alzheimer's disease to perform various daily activities (e.g., prepare coffee, set the table). Video prompting was effective for all participants and results from this study suggest that this instructional strategy may serve as a valuable alternative to other instructional strategies for older adults (Perilli et al., 2013). In addition, results from a social validity assessments revealed that participants' performance was rated more favorably by assigned "raters" (i.e., university psychology students and graduates) in the video-prompting condition (Perilli et al., 2013). That is, the raters found that participants looked more comfortable using the video prompting strategy and found video prompting to be more beneficial for the participants and more compatible with their daily routine (Perilli et al., 2013). In addition, the raters believed that the video-prompting strategy would receive more support from the participant's caregivers and family members (Perilli et al., 2013). Results from these studies, combined with those of Mihailidis et al. and Perilli et al., highlight the promise of video prompting when teaching older adults to use the Internet and related ICTs.

Both video modeling and prompting offer an advantage over live modeling and other instructional methods because it can be made available on portable devices such as phones, iPods®, and iPads® (Hammond et al., 2010). The use of a portable device is particularly advantageous because it can be used in any environment and with any instructor (Hammond et al., 2010). In addition, when video modeling and prompting procedures are used on a portable device such as an iPad®, the learner is able to use the prompts as needed and at their leisure (Hammond et al., 2010). *VideoTote* is computer software designed for the purposes of video modeling and video prompting that uses a portable electronic device (e.g., iPad®, tablet; Burke et al., 2013). When an iPad® is equipped with the VideoTote application, it can be used as a training device for the learner to review the prompts as needed (Burke et al., 2013). VideoTote is equipped with a “chapter” format in which tasks can be divided into relevant TA steps or “chapters.” Furthermore, each chapter can be personalized with voice-over instructions in order to enhance learning and further promote the acquisition of skills (Burke et al., 2013). The VideoTote application allows the learner to choose from a video modeling format (i.e., viewing all scenes or chapters without stopping) or a video prompting format (i.e., pausing after each chapter to perform the relevant TA step; Burke et al., 2013). VideoTote can be used at one’s own pace and has a user-friendly interface designed with a simple layout that consists of a limited number of large icons on the screen (Burke et al., 2013).

Being a newly designed software, only two studies to date have currently been conducted that have evaluated the effectiveness of VideoTote for video modeling and prompting purposes. Burke et al. (2013) used a multiple baseline across participant’s design to evaluate the effectiveness of video modeling via the VideoTote application on a portable tablet to teach individuals with autism spectrum disorder (ASD) to complete a multi-step shipping task at their job site. During the intervention phase, video prompting (VideoTote application) was used to teach participants to perform the target shipping task. That is, participants watched a VideoTote chapter for each step of the shipping task. After watching one VideoTote chapter, participants completed the step just viewed (Burke et al., 2013). Results from this study suggested that VideoTote (i.e., video prompting) was effective in helping participants complete the 104-step shipping task at their job site. Furthermore, both users and their parents rated VideoTote as an acceptable treatment for use in applied settings (e.g., the workplace) and to be simple and relatively easy to use (Burke et al., 2013). Allen et al. (2015) used VideoTote to teach a young adult with ASD and an intellectual and developmental disability to (a) request help, (b) check out at store, and (c) order food at a restaurant. Results from this study suggested that VideoTote was successful in increasing performance across all three tasks. It is worth noting that this study used VideoTote for video modeling purposes, not video prompting. That is, the participant watched an entire video on how to complete a target task rather than video segments or chapters for each step of the target task. Implications from these studies suggest that VideoTote may be effective for both video modeling and video prompting purposes when teaching individuals to perform new skills.

Research demonstrating the effectiveness of VideoTote for video modeling and video prompting remains limited; however, Burke et al. (2013) suggested that the VideoTote software is an effective tool for teaching novel skills due its functionality, portability, and ease of use. To date, no research has been conducted using VideoTote to evaluate the effects of video modeling or video prompting for teaching skills to older adults. The strategies used in VideoTote address the learning needs of older adults by (a) allowing learners to progress at their own pace, (b) providing multiple opportunities for practice, and (c) by incorporating a user-friendly interface that consists of large icons, limited text and icons on the screen, and easy navigation. As such, VideoTote could prove to be an appropriate and effective teaching strategy for teaching older adults how to use ICTs as well as perform other skills.

To date, five studies have been conducted on the comparison of video modeling and video prompting to teach various functional skills to a diverse population. Overall, results from these studies suggest that video prompting is more effective than video modeling in promoting the acquisition of novel skills (Cannella-Malone et al., 2006, 2011; Mechling et al., 2014; Van Laarhoven & Van Laarhoven-Meyers, 2006). Cannella-Malone et al. (2006) used an alternating treatments design to compare video modeling and video prompting to teach six adults with developmental disabilities to set a table and put away groceries. Results suggested that video prompting was effective for five out of six participants and that video modeling was generally shown to be ineffective. Canella-Malone et al. (2011) replicated their 2006 study by comparing the effects of video prompting and video modeling for teaching seven students with developmental disabilities to do laundry and wash dishes. Again, the authors found video prompting to be more effective than video modeling for six of seven participants and that video modeling was generally ineffective. These findings provide further support for the superiority of video prompting over video modeling for teaching functional skills to individuals with developmental disabilities. A study conducted by Van Laarhoven and Van Laarhoven-Meyers (2006) used an adapted alternating treatments design to compare three video-based instructional methods (i.e., video model rehearsal, video model rehearsal plus in-vivo photo prompts, video model rehearsal plus in-vivo video prompting) for teaching functional skills (i.e., folding laundry, cooking, cleaning) to three students with developmental disabilities. All three instructional methods were effective in promoting the acquisition of skills; however, results suggested that video prompting was more efficient in terms of number of sessions required to reach acquisition criterion (Van Laarhoven & Van Laarhoven & Meyers, 2006). More recently, Mechling et al. (2014) used an adapted alternating treatments design within a multiple probe across behaviours design to compare the effectiveness of three modeling procedures (i.e., video modeling, video prompting, continuous video modeling [i.e., a video model played repeatedly]) on the daily living skills performed by three high school students with intellectual disabilities. Overall, video prompting was more effective across the three students; however, Mechling et al. suggested that the effectiveness of the video-based intervention may also be dependent on the learner and the type of task being taught. One final study conducted by Taber-Doughty et al. (2011) compared video modeling and video prompting to teach cooking skills to three sixth-grade students with intellectual disabilities. Both prompting procedures were effective in improving participant performance from baseline levels; however, unlike the other comparative studies, video modeling was more efficient than video prompting for two of three participants.

Based on the results of these five comparative studies, video prompting appears to be a superior instructional method relative to video modeling (Cannella-Malone et al., 2006, 2010; Mechling et al., 2014; Taber-Doughty et al., 2011; Van Laarhoven & Van Laarhoven-Meyers, 2006). One possible reason why video prompting may be more effective than video modeling may be because the short video clips of the individual TA steps (used in video prompting) place fewer demands on the learner’s attention and memory (Gardner & Wolfe, 2013). This is especially relevant for older-adult learners as they often experience cognitive declines in the form of memory loss and difficulties attending (Berkowsky et al., 2013; Charness & Holley, 2004). Given the results of the comparative studies and the potential advantages of video prompting over video modeling, video prompting may be a more appropriate method of instruction for teaching Internet and ICT skills to older adults. Furthermore, the VideoTote software may be appropriate to use for video prompting with older adult learners because of its user-friendly design and its self-pacing capabilities.

***Textual prompts.*** In addition to modeling procedures, textual prompts are another prompting procedure commonly used in conjunction with chaining procedures to teach new skills (e.g., MacDuff et al., 2001; Seaver & Bourret, 2014). Textual prompts involve the use of written cues or written task analyses to promote the acquisition of skills (MacDuff et al., 2001; McAdam & Cuvo, 1994). Textual prompts in the form of scripts, checklists, and text-based instructions have been used to teach a variety of skills to multiple populations (MacDuff et al., 2001).

Scripts (and script fading) are an example of a type of textual prompt that consists of a written dialogue (i.e., script) that models appropriate language and conversation (Brown et al., 2008). As such, scripts are used to teach spontaneous language and conversation skills (Brown et al., 2008) and are often used with children with developmental disabilities and language and communication deficits (e.g., Brown et al., 2008; Krantz & McClannahan, 1993; Krantz & McClannahan, 1998; Sarokoff, Taylor, & Poulson, 2001). Scripts are often systematically faded using a script fading procedure in order to promote “spontaneous language,” in which language is under the discriminative control of naturally occurring environmental stimuli (opposed to the discriminative control of the textual prompt or script; Brown et al., 2008). Scripts have also been used to enhance conversation skills for older-adult individuals with dementia (Bourgeois, 1990, 1993). Despite, the use of scripts with older-adult populations, this type of textual prompt has only been used to promote language and conversation skills and may not be useful for teaching other skills to older adults such as how to use the Internet and ICTs.

Another example of a textual prompt is a written checklist, which consists of a list of steps or words that prompt an individual to complete a given task (Taylor et al., 2010). Checklists have been successfully used as a memory aid and teaching tool for individuals with memory impairments (e.g., Wong, Seroka, & Ogisi, 2000), adults with brain injury (e.g., Zenicus et al., 1991), and adolescents (e.g., Taylor, Anderson, & Mudford, 2010). Previous applications of checklists include teaching functional skills (e.g., self-care, vocational tasks) to individuals with brain injury (Zenicus et al., 1991). In addition, a study conducted by Wong et al. (2000) utilized a checklist to teach an individual with memory-impairment to measure their blood-glucose levels. Checklists have also been used with adolescents in a substance abuse treatment program to assist them in preparing and gathering necessary items for various program activities (Taylor et al., 2010). To our knowledge, no studies have evaluated the use of checklists for teaching new skills to older-adult learners, and more specifically to teach older adults to use the Internet and ICTs.

Textual prompts in the form of text-based instructions are perhaps the most popular form of textual prompts and remain the most pervasive and established form of instruction across all populations, including older adults (Morris, 1994). Text-based instructions consist of written instructions or a written TA that explicitly lists each step in a behaviour chain (Miltenberger, 2016, pp. 215). In addition, text-based instructions are often presented with pictures of relevant stimuli (Tyner & Fineup, 2015). Text-based instructions have been used to teach various skills and applications to individuals with developmental disabilities (e.g., Cuvo et al., 1992.; McAdam & Cuvo, 1994), brain-injured populations (e.g., O'Reilly & Cuvo, 1989), as well as typically developing populations (e.g., Tyner & Fineup, 2015). These skills include: cleaning skills (Cuvo et al., 1992), self-management skills (McAdam & Cuvo, 1994), self-care skills (O'Reilly & Cuvo, 1998) and computer skills (Tyner & Fineup, 2015). Text-based instructions, often in the form of instruction manuals, are commonly used with older-adult populations to teach Internet and ICTs skills (Czaja, 1997; Czaja, Hammond, Blascovich, & Swede, 1989; Dauz et al., 2014;

White et al., 1999; Woodward et al., 2013). In a study conducted by Czaja et al. (1989), older adults were taught to operate a computer program using either manual-based training, instructor-based training, or on-line training. Results from this study indicated that both manual-based and instructor-based training were superior to on-line training for all participants, suggesting that instructional manuals using text-based instructions (i.e., written instructions and pictures) are effective for teaching older adults how to operate ICTs (Czaja et al., 1989).

Text-based instructions have the potential to serve as an appropriate teaching method for older adults as they can be adapted to address the needs of older-adult learners (e.g., increased font size, easy-to-read font, simple language, relevant pictures, etc.; Berkowsky et al., 2013; Czaja, 1997; Dauz et al., 2004). For example, Berkowsky et al. (2013) used a training manual to supplement their ICT-training program for older adults. This training manual consisted of text-based instructions and was enhanced to include enlarged font in order to accommodate the learning needs of the older-adult participants (Berkowsky et al., 2013). Although the authors did not collect a direct measure of participant performance, older-adult participants reported being more comfortable and less intimidated when using ICTs following the ICT-training program (Berkowsky et al., 2013). In addition, participants reported being able to use the computer in more reliable ways following ICT training. These findings highlight the potential of text-based instructions to be an effective method of instruction for older adults. Further, text-based instructions offer a more self-paced and individualized learning experience (Morris & Ballard, 2003), making it an appropriate behaviour analytic method of instruction for teaching older adults to use the Internet and ICTs. This is particularly relevant given that Nahm and Resnick (2001) found that older adults preferred personalized printed step-by-step instructions when learning to use the Internet and ICTs.

***Comparison of video prompting and text-based instructions.*** Both video prompting and text-based instructions (in conjunction with total task chaining) have the potential to serve as effective behaviour analytic instructional methods for teaching older adults how to use the Internet and ICTs. These prompting strategies appear to address several of the learning needs and challenges experienced by older adults and offer several advantages over other methods of instruction that are typically used with younger populations (e.g., trial and error, online tutorials, group instructions). For example, both prompting strategies can be considered to be a form of independent education and, as such, allow for self-pacing and individualized learning (Gist, Rosen, and Schwoerer, 1988; Morris & Ballard, 2003). In addition, the portability of both prompting procedures (i.e., text-based instructions on paper or in book format and video prompting on a tablet) aids in the generality of skills taught as it allows the learner to apply these skills in natural settings (i.e., at home; Miltenberger & Charlop, 2015). Collectively, these advantages make either prompting procedure a suitable method of instruction for teaching Internet and ICT skills to older adults; however, the superiority of one prompting procedure over another has yet to be determined.

To our knowledge, no studies exist comparing the effectiveness and efficiency of text-based instructions and video prompting to teach new skills to older adults, or to any other population. However, few studies have compared the effectiveness (and occasionally the efficiency) of text-based instructions and video modeling, which is similar to video prompting in that they both involve modeling via video demonstration; Gist, Rosen, and Schwoerer, 1988; Howard & DiGennario Reed, 2014; Tyner & Fineup, 2015). A study conducted by Howard and DiGennario Reed (2014) evaluated the effects of sequential training methods involving text-based instructions and video modeling on the performance of dog-shelter volunteers for teaching obedience skills to shelter dogs. Results from this study revealed that performance did not appear to improve from baseline levels with the addition of text-based instructions (Howard & DiGennario Reed, 2014). However, when video modeling was introduced, performance improved, suggesting that video modeling procedures were more effective than text-based instructions in teaching dog-shelter volunteers to train shelter dogs in obedience skills (Howard & DiGennario Reed, 2014). In a study conducted by Tyner and Fineup (2015), a between-groups design was used to compare the effects of video modeling, text-based instructions, and no instructions on students' graphing performance using a computer program. Results from this study revealed that students in the video modeling condition demonstrated greater graphing accuracy as well as faster performance and fewer errors compared to the those using text-based instructions and no instruction (Tyner & Fineup, 2015). Implications from this study not only suggest that video modeling may be more effective and efficient than text-based instructions, but that it may also be an effective method of instruction for teaching computer-related skills (Tyner & Fineup, 2015). Finally, a study conducted by Gist et al. (1988) compared the effectiveness of a video modeling training method to an interactive tutorial involving step-by-step text-based instructions to teach computer skills to younger (under 45) and older (45 and over) trainees. Results revealed that video modeling was more effective than tutorial training for both the younger and older trainees (Gist et al., 1988). Results from these comparative studies suggest that video modeling is more effective (and possibly more efficient) than text-based instructions in teaching new skills across various populations.

Although the studies mentioned did not include video prompting in their comparisons with text-based instructions, video prompting may produce similar results to video modeling and may offer similar advantages over text-based instructions for teaching Internet and ICT skills to older adults. For example, video demonstrations may make the relevant stimuli more salient, which may enhance the control exerted by these stimuli when individuals are later faced with the task. This may help the learner perform the necessary steps in the order in which they need to be performed (Gist et al., 1988; Tyner & Fineup, 2015). This is especially relevant given that older adults typically experience challenges with memory and may have difficulties remembering the TA steps as well as the order in which they occur (Berkowsky et al., 2013; Charness & Holley, 2004). Further, the step-by-step instructions offered via video prompting may be a more suitable method of instruction for older adults given the novelty and complexity of ICT-related tasks as they place fewer demands on attention and memory-related tasks (Burke et al, 2013; Gardner & Wolfe, 2013). As such, video prompting may actually offer several advantages over text-based instructions and may therefore be a more suitable method of instruction for teaching older adults to use the Internet and ICTs.

Despite the advantages and the current research supporting video-based modeling procedures over the use of text-based instructions, text-based instructions also offer several advantages as an instructional method for older-adult learners. Historically, text-based instructions have been utilized as an instructional method to teach new skills (e.g., instructional manual or user guides for new appliances, electronics, and assembly of procedures; Morris, 1994). As such, text-based instructions in the form of a book or instructional manual may be a more familiar method of instruction for older-adult learners. This is particularly true compared to video prompting on a tablet device, which older adults have less experience and familiarity with. Unlike video prompting, text-based instructions can be individualized to accommodate the learning needs and challenges associated with aging such as physical decline (e.g., declining eye sight, decline of fine motor skills; Berkowsky et al., 2013; Charness & Holley, 2004; Morris &

Brading, 2007; Nahm & Resnick, 2001). In addition, the response effort for developing text-based instructions is lower compared to video prompting. For example, it likely takes less time to develop written instructions than it does to film the target task and create voice-over instructions that are in-synch with each step of the target task (Tyner & Fineup, 2015). Text-based instructions are also more cost-effective, unlike video prompting which requires a portable device such as a tablet, iPad® or iPod® (Perilli 2013). For these reasons, text-based instructions may be a superior instructional method for teaching older adults to use the Internet and ICTs.

Both video prompting and text-based instructions contain their own advantages and limitations. In addition, both prompting strategies have been demonstrated to be effective behaviour analytic instructional methods that can be applied to older-adult learners to teach Internet and ICT skills. Therefore, research comparing the effectiveness and efficiency of these two procedures is needed. In particular, further research is required to compare the effectiveness of text-based instructions and video prompting in order to determine the superior prompting strategy for teaching Internet and ICT skills to older adults. Further, when determining a superior method of instruction, the efficiency of the procedure(s) as well as participants' preference should also be considered (Perilli et al., 2013).

**Purpose**

The purpose of the current investigation was to compare the effectiveness and efficiency of video prompting and text-based instructions on the acquisition of Internet and ICT-related skills for older-adult learners. The Internet and ICTs have the potential to enhance the quality of life of older adults and improve their social interaction and communication with others. Therefore, the identification of an instructional method that is effective and efficient in teaching

Internet and ICT skills to this population is of particular importance given the continuous developments and advancements in technology (Czaja, 2001; Czaja, 1997, ppp.797).

## Method

### Participants and Setting

The experimenter contacted recreational and leisure staff at local retirement residences to recruit participants. Staff were provided with a description of the purpose and methods involved in the current investigation. Staff were also provided with a copy of the Letter of Invitation and were asked to share the Letter of Invitation with any residents who they believed would be appropriate for the study. Any residents who expressed interest to the staff then met with the researcher for a general information session in which the Letter of Invitation, Consent Form, and the general procedures of the study were reviewed.

Three older adults, with no known cognitive impairments, who resided in a local retirement residence participated in this study. All participants had limited to no experience using an iPad®. Janice was a 75-year-old woman, and was the only subject who owned her own iPad®. Prior to the start of the study, Janice only used her iPad® to play games (e.g., scrabble) and to take pictures. The remaining two subjects had never used an iPad®, but did own a computer. Doris was a 91-year-old woman who owned a desktop computer, which she used to check emails on a weekly basis. Henry was a 93-year-old-man who owned a laptop computer, which he did not use, but turned on monthly to make sure it was still operating. All participants had the required prerequisite skills which consisted of the ability to (a) visually discriminate images on a 24.6-cm screen, (b) read size 18 Times New Roman font on standard letter-size paper (21.59 cm by 27.94 cm), (c) complete various movements associated with manipulating buttons on an iPad® (i.e., typing letters on the onscreen keyboard, dragging finger up, down, left, and right on the screen to scroll, tapping the screen to open applications and to select options; Hammond, Whatley, Ayres, & Gast, 2010), and (d) hear a video that was played on an iPad®. All experimental sessions were conducted in a small room within the participants' retirement residence in the Greater Toronto Area. The session room contained a table, at least two chairs, a video camera, two iPads®, data sheets, writing utensils, speakers, and text-based instructions, when necessary.

**Tablet-Based Tasks and Materials**

**Task analyses.** Three tablet-based tasks were selected for this study, all of which focused on increasing communication with others via ICTs. These tasks included making an online video call (i.e. FaceTime®), sending an e-mail, and searching for a YouTube™ video. Prior to the start of the study, researchers consulted experienced tablet users to develop and approve the task analysis (TA) for each tablet-based task (see Table 1 for a complete description of each TA). To ensure that task difficulty was equated across all tasks, a logical analysis of each TA was conducted to assess (a) the number of steps required for completion (Wolery, Gast, & Hammond, 2010), (b) the mean time required to complete each TA (Mechling & Collins, 2012; Mechling & Smith, 2013; Wolery, Gast, & Hammond, 2010), and (c) the nature of the movements required to complete each TA (Holcombe, Wolery, & Gast, 1994; Wolery et al., 2010). The results of the logical analysis are depicted in Table 2. Between six to seven TA steps were required to complete each of the tablet-based tasks. The mean completion times were 27 s, 23 s, and 27 s for FaceTime®, email, and YouTube™ tasks, respectively, suggesting that all tasks took nearly the same amount of time to complete. Further, each tablet-based task required the same type of movement for completion (i.e., the "finger tap"). Taken together, these results suggest that all three tablet-based tasks were relatively equal in difficulty.

Table 1

*Task Analyses and Response Definitions for 3 Tablet-Based Tasks*

| Making a video call (FaceTime®) | Sending an e-mail | Searching for a YouTube™ video |
|---|---|---|
| 1. Tap on the “FaceTime®” application | 1. Tap on the “Mail” application | 1. Tap on the “YouTube™” application |
| 2. Tap the box at the top of the screen that says “enter name, email, or number” | 2. Tap the “compose mail” icon located in the top right corner of the screen | 2. Tap the “search” icon located at the top right corner of the screen |
| 3. Type in the name of the person you wish to video call. Type **“Jackie”** | 3. In the “To:” box, type the name of the person you wish to email. Type **“Jackie”** | 3. Type some words that describe the video that you want to watch into the search field (e.g., if you want to watch a video on how to change a tire, you can type, “how to change a tire”) |
| 4. Once **“Jackie”** appears, tap the video camera icon located to the right of the name, **“Jackie”** | 4. Tap on the name **“Jackie”** once it appears | 4. Tap on the blue “search” button located on the keyboard |
| 5. Make sure the camera is oriented toward you and wait for the contact to answer the call | 5. Tap on the “subject” box (below the “To:” box) and type the word, **“Hi”** | 5. Use your index finger to scroll up and down on the screen. Tap firmly on the video that you want to watch. |
| 6. To hang up, tap anywhere on the screen and then press the red phone icon located at the bottom of the screen | 6. Tap on the message box (below the subject box) and type, **“How are you?”** | 6. Increase the size of the video by tapping on the video and then tap on the small square icon located on the bottom right corner of the video screen |
| | 7. Tap on the “send” icon located on the top right corner of the screen | 7. When you are finished watching, return to your search by tapping on the video screen and then tap on the small square icon located on the bottom right corner of the video screen. |

Table 2

*Summary of logical analysis for three tablet-based tasks*

| Measure | Making a video-call (FaceTime®) | Sending an e-mail | Watching a YouTube™ video |
|---|---|---|---|
| No. steps / task | 6 | 7 | 7 |
| Mean completion time (s) | 27[a] | 23 | 27[b] |
| Nature of movements | "finger tap" | "finger tap" | "finger tap" |

[a] Time may vary depending on how long it takes the receiver answers the call.
[b] Does not take into account duration of YouTube™ video.

**Materials.**

***VideoTote software.*** An application called *VideoTote* (Burke et al., 2013) was used for the video-prompting condition. VideoTote was downloaded on an iPad Air 2®, a computer tablet device that weighed 0.44 kg and was equipped with a 24.6-cm picture display. The iPad® was also equipped with a protective case that also served as a horizontal stand for the iPad®. VideoTote recordings displayed an adult model (i.e., the researcher) demonstrating how to complete each TA step for each of the three tablet-based tasks. Each TA step served as a chapter such that a video of a seven-step TA, for example, consisted of seven chapters. All video recordings were filmed from the participant's point of view and only showed the iPad® and the hands of the model performing the task on the iPad®. Voice over instructions were also provided for each step given that previous researchers noted that both video demonstration and voice-over instructions are typically involved in video-prompting procedures (Bennet et al., 2013; Burke et al., 2013; Mechling & Collins, 2012; Smith, et al., 2013).

***Text-based instructions.*** The text-based instructions for each tablet-based task included written TAs with enlarged font (i.e. size 18 Times New Roman font) and corresponding pictures for each step of the TA (see Appendices A, B, and C). Picture prompts were also included as they are often cited as a critical feature of instructional manuals or books that contain text-based instructions (Tyner & Fineup, 2015). The text-based instructions were identical to the voice over instructions in the video-prompting condition.

## Experimental Design and General Session Structure

**Experimental Design**. An adapted alternating treatment design (Sindelar, Rosenberg, & Wilson, 1985) was used to compare the effects of text-based instructions and video prompting on the acquisition of tablet-based tasks with three older adults. The experiment consisted of two phases: baseline and prompt comparison. In addition, a follow-up assessment was conducted to assess the maintenance of treatment effects.

**General Session Structure.** Experimental visits were conducted two to three times per week, with one to five sessions conducted per visit. No more than two sessions with the same tablet-based task were conducted in an experimental visit. One tablet-based task was assessed per session and each session was approximately one to eight minutes in duration. In addition, participants received a 1- to 2-min break between sessions. Sessions continued until the participant reached acquisition criterion. The assignment of tablet-based tasks to conditions (i.e., text-based instructions, video prompting, and control) was determined quasi-randomly, such that no more than two tablet-based tasks were assigned to the same prompting procedure for all participants. In addition, the order in which conditions were conducted was counterbalanced across participants.

## Response Measurement

Trained observers scored the occurrence of each dependent variable per TA step. All responses were manually recorded on a data sheet immediately after the participant emitted the response. These data were then converted to a percentage for data analysis purposes. Data collected during sessions in which prompts were provided (i.e., teaching sessions) were not analyzed in the treatment evaluation given that identification of the prompting procedure more likely to produce independent responding was the primary concern in the current experiment. Rather, teaching-session data were used to help inform the relative efficiency of the two prompting procedures. As such, all sessions used to inform the effectiveness of the different prompting procedures on the independent performance of the tablet-based tasks were identical to baseline.

**Treatment Evaluation.**

***Baseline, control, and pre-session probe sessions.*** The primary dependent measure during all sessions in the treatment evaluation (baseline, control, and pre-session probes) was the percentage of independent responses. An *independent response* was defined as the participant completing the correct TA step without any assistance or prompts within 10-s of the completion of the previous TA step or a task direction. *Task directions* included any instruction from the researcher regarding a TA step that (a) initiated the chain (e.g., “send a FaceTime® video call to Jackie”), (b) was not required to complete the chain in sequence (e.g., “what would you do if you wanted to increase the size of the video?”), or (c) followed a contrived aspect of the chain (e.g., after the participant and the experimenter had a brief conversation using the FaceTime® application, the experimenter said, “okay, now let’s say that the conversation is over. What would you do next?”). Data were also collected on errors and requests for assistance. *Errors* included (a) *topography errors*, in which the participant performed a TA step incorrectly or out of order from the task sequence and (b) *latency errors*, in which the participant failed to initiate a TA step within 10-s of the completion of a previous TA step or a task direction (Hammond, Whatley, Ayres, & Gast, 2010). A *request for assistance* was defined as the participant requesting help from the researcher to complete any step in the TA (e.g., "Can you help me?").

***Teaching sessions.*** The primary dependent measure during teaching sessions was the percentage of correct prompted responses. A correct prompted response was defined as the participant completing the correct TA step following consumption of a prompt (i.e., text-based instructions or video-prompts). Data were also collected on topography errors and requests for assistance (see above for definitions).

## Procedures

**Pre-tests.** Four pre-tests were conducted prior to baseline to determine participants' eligibility for this study. Pre-tests included a hearing test, reading test, vision-discrimination test, and a motor test. The pre-tests were also used to determine the (a) appropriate volume for the voice over directions on the VideoTote application and (b) appropriate font size for the text-based instructions. Inclusion of these pre-tests ruled out the possibility that participant responding during the prompt-comparison phase was a function of the independent variables arranged in the current study and not an inability to hear the voice over directions played on the iPad®, read text-based instructions, visually discriminate icons on the iPad®, or perform iPad®-related motor tasks. Specifically, the *hearing test* was used to determine if the participant could hear instructions played from the iPad®; this test consisted of instructing the participant to watch a video and asking the participant to repeat what he or she heard. External speakers were provided if the participant reported hearing difficulties or did not repeat the instruction correctly. All participants required the use of external speakers during the video-prompting condition. The *reading test* was used to determine if the participant could read simple phrases on a sheet of paper. This test consisted of instructing the participant to read, "She went to the store to purchase bread and milk” from a standard letter-sized piece of paper. The phrase was written in size 18, Times New Roman font. The *vision-discrimination test* was used to determine if the participant could identify and discriminate between different icons on the iPad® screen. This test consisted of instructing the participant to touch three different icons on the iPad® screen: the music note icon (i.e., the music app), the camera icon (i.e., the camera app), and the book icon (i.e., iBooks® app). The *motor test* was used to determine if the participant could manipulate the keyboard on the iPad® screen. This test consisted of instructing the participant to type out the following phrase using the iPad® keyboard, “The quick brown fox jumps over the lazy dog.” This phrase was selected for the motor test because it contains all letters of the alphabet and therefore requires the participant to touch every letter on the iPad® keyboard.

**Treatment Evaluation.**

***Baseline.*** The purpose of baseline was to assess the participant’s current level of performance on the tablet-based tasks prior to exposure to the prompting procedures. Participants were presented with the iPad® and asked to complete a tablet-based task independently. Independent completion of each step of the TA resulted in a brief statement that provided information on the accurate performance of that step (e.g., “That’s correct”). Errors or requests for assistance resulted in the researcher saying, “I will help you with that one” while completing that step out of the participant’s line of vision (i.e., the participant did not see how the researcher completed that step). After the researcher completed that step for the participant, the tablet was handed back to the participant and the participant was asked to continue with the task until the final step of the TA is completed.

***Prompt Comparison.*** The purpose of the prompt-comparison phase was to compare the effectiveness and efficiency of text-based instructions and video prompting on the acquisition of tablet-based tasks. Two types of sessions were conducted during the prompt-comparison phase; namely, pre-session probes and teaching sessions. Three conditions were compared during the prompt-comparison phase: text-based instructions, video prompting, and the control condition. Each tablet-based task was quasi-randomly assigned to one of the two prompting conditions (text-based instructions or video prompting) or to the control condition. The prompt-comparison phase continued until the participant reached the acquisition criterion in at least one of the prompting conditions. The acquisition criterion was defined as 100% independent responses across three consecutive pre-session probes (Hammond et al., 2010).

*Sessions*

*Pre-session probes***.** Prior to teaching sessions, pre-session probes were conducted with both tablet-based tasks assigned to a prompting condition. Pre-session probes were identical to baseline and were conducted to assess learning as a function of exposure to the prompting procedures. Pre-session probes were not conducted with the tablet-based task assigned to the control condition. If the participant responded independently on all steps of the TA during the pre-session probe, the teaching session for that tablet-based task was not conducted during that experimental visit. If the participant did not perform 100% of the TA steps independently during the pre-session probe, the teaching session was conducted for that task during that experimental visit. See Appendix D for a sample data sheet for pre-session probes.

*Teaching sessions.* Teaching sessions were only conducted with tablet-based tasks assigned to a prompting condition (i.e., teaching sessions were not conducted with the control task). Total task chaining was used during each prompting condition. That is, the participant was taught to complete each step of the TA during each teaching session. Teaching sessions were identical to baseline with the following exceptions (a) participants were provided with text-based instructions or video-prompts to complete the task, (b) a 10-s latency criterion was not included (i.e., participants could consume each prompt for as long as needed), and (c) data were collected on correct *prompted* responses. See Appendix E for a sample data sheet for teaching sessions.

*Conditions*

*Text-based instructions.* Participants were given the sheet of paper with written instructions and pictures for the tablet-based task assigned to this condition. Participants were then asked to complete the tablet-based task by following the text-based instructions one step at a time. Correct completion of each step of the TA resulted in a statement that provided information on the accurate performance of that step (e.g., “that’s correct”). Incorrect completion or requests for assistance resulted in the researcher completing that step of the TA outside of the participant’s line of vision. This was repeated until the TA was completed.

*Video prompting.* Prior to conducting each video prompting session, the researcher provided participants with (a) verbal instructions on how to use VideoTote and (b) a short demonstration on how to use VideoTote to complete a 3-step task on the iPad®. The 3-step task modeled in the demonstration consisted of: pressing the home button, sliding your finger across the screen and entering the passcode. Before the teaching session began, the researcher reminded participants that they must watch the entire chapter before attempting to perform the step on their own iPad®. Participants were also reminded that they could watch each chapter as many times as they would like, and that they could move to the next chapter themselves or by asking the researcher to move them to the next chapter. During the video-prompting condition, participants were given video-prompts (via VideoTote) for the tablet-based task that was assigned to this condition. Participants were asked to complete the tablet-based task, one step at a time, by watching a VideoTote chapter for each step of the TA. A VideoTote chapter played and automatically stopped after each step, at which point the participant completed that step on his or her iPad®. Correct completion of each step of the TA resulted in a statement that provided information on the accurate performance of that step (e.g., "that's correct'). Incorrect completion or requests for assistance resulted in the researcher completing that step of the TA outside of the participant's line of vision. These steps were repeated until the TA was complete.

*Control.* The control condition was conducted intermittently with the pre-session probes throughout the prompt-comparison phase and was identical to baseline. The control condition was conducted with a tablet-based task not assigned to a prompting condition. That is, no treatment was evaluated in the control condition in order to determine if carry-over effects, history effects or maturation effects influenced participant responding (Wolery et al., 2010).

**Follow-up Assessment.** One follow-up probe was conducted with each tablet-based task one week after the acquisition criterion was met. Follow-up probes were identical to baseline and assessed the maintenance of performance demonstrated under each prompting condition during the prompt-comparison phase.

**Data Analysis**

The primary purpose of the current investigation was to determine which, if any, prompting procedure was more *effective* to teach older adults to independently use Internet-related technology. As such, only data from baseline, control, and pre-session probe sessions were graphed given these data depicted *independent* responding. Data from teaching sessions depicted prompted responding, and thus, were not included in this analysis. However, data from teaching sessions were analyzed to assess the *efficiency* of these two prompting procedures. Efficiency data were collected during teaching sessions on the (a) number of sessions to reach the acquisition criterion, (b) total duration of sessions, and (c) average duration of sessions.

**Social Validity**

A social validity questionnaire was administered to participants within two weeks of their completion of the study. The purpose of the social validity questionnaire was to gather additional information on participants' (a) preference for each prompting procedure, (b) perceived helpfulness and ease of each prompting procedure, (c) perceived helpfulness of the skills taught, (d) relative comfort level with the device, and the (e) likelihood that participants would use this device in the future for social and communicative purposes. This questionnaire consisted of eight questions on a 5-point rating scale and three multiple choice questions (see Appendix F). A separate social validity questionnaire was administered to Janice, who was the only participant who owned (and used) an iPad® prior to the start of the study in order to gather additional information regarding her iPad® use and activity following completion of the study. This questionnaire was identical to the original social validity questionnaire with the exception of three additional questions on a 5-point rating scale (see Appendix G).

**Interobserver Agreement and Procedural Integrity**

**Interobserver Agreement.** Interobserver agreement (IOA) was assessed during an average of 45% (range, 33% to100%) of sessions during each condition in each phase for all participants. A second independent trained observer collected data post hoc (i.e., via video recording) on all dependent variables. These data were compared on a step-by-step basis. An agreement was defined as both observers recording the same response (i.e., either an occurrence or nonoccurrence of an independent response, correct prompted response, latency error, topography error, and a request for assistance) for each step of the task analysis. Trial-by-trial IOA was calculated by dividing the number of agreements by the total number of agreements plus disagreements and converting the ratio to a percentage. IOA was also calculated on the duration of sessions and was calculated by dividing the shorter session duration by the longer session duration and converting the ratio to a percentage. Interobserver agreement for all subjects' (a) independent responding was 100%, (b) correct prompted responding was 99% (range, 97% to 100%), (c) latency errors was 98% (range, 71% to 100%), (d) topography errors was 99% (range, 67% to 100%), requests for assistance was 99% (range, 67% to 100%), and (e) duration of sessions was 96% (range, 63% to 100%).

**Procedural Integrity.** Procedural integrity was assessed during an average of 45% (range, 33% to 100%) of sessions during each condition in each phase for all participants. A second independent observer collected data on the following researcher behaviours: correct feedback on correct prompted and independent responses, errors (latency errors and topography errors), and requests for assistance. Correct feedback on correct and independent responses consisted of the researcher providing a brief statement that provided information on the accurate performance of a step (e.g. "That's correct"). Correct feedback on errors and requests for assistance consisted of the researcher providing a brief statement such as "I will help you with that one" and completing the target TA step outside of the participant's line of vision. In addition, data were collected on therapist delivery of task directions. *Task directions* included any instruction from the researcher regarding a TA step that (a) initiated the chain (e.g., "send a FaceTime® video call to Jackie"), (b) was not required to complete the chain in sequence (e.g., "what would you do if you wanted to increase the size of the video?"), or (c) followed a contrived aspect of the chain (e.g., after the participant and the experimenter had a brief conversation using the FaceTime® application, the experimenter said, "okay, now let's say that the conversation is over. What would you do next?"). Procedural integrity was calculated by dividing the number accuracies by the total number of accuracies plus inaccuracies and converting the ratio to a percentage. Mean procedural integrity across all participants was 99% (range, 86% to 100%) for the delivery of correct feedback and 99% (range, 80% to 100%) for the delivery of task directions.

## Results

### Treatment Evaluation

**Doris.** The percentage of independent responding emitted by Doris is depicted in the top panel in Figure 1. During baseline, low to zero levels of independent responding were observed during each tablet-based task. During the prompt-comparison phase, the FaceTime® task was assigned to the text-based instructions condition, the e-mail task was assigned to the video-prompting condition, and the YouTube™ task was assigned to the control condition. A similar pattern of responding was observed under both prompting conditions. That is, Doris reached the acquisition criterion in 15 sessions in the video-prompting condition and in 14 sessions in the text-based instructions condition. These data indicate that both prompting procedures were comparable and nearly equally effective in promoting independent performance on both tablet-based tasks. In addition, independent responding maintained at 100% at follow up in both the text-based instructions and the video-prompting conditions. Independent responding during the control condition throughout the prompt-comparison phase remained stable (M= 33%; range, 29% to 43%); however, it was slightly higher than the level of independent responding observed during baseline, suggesting that some stimulus generalization may have occurred from baseline to treatment. Despite this, differentiated responding was observed between the control and both prompting conditions, indicating that Doris' responding in all conditions was not influenced by carry-over effects from the prompting procedures.

Efficiency data are depicted in Table 3. For Doris, the total number of teaching sessions in the video-prompting condition was 11 and was 10 in the text-based instructions condition. The total duration of teaching sessions in the video-prompting condition was 48 min 25 s, with an average duration of 4 min 24 s (range, 2 min 35 s to 8 min 40 s). The total duration of teaching sessions in the text-based instructions condition was 28 min 30 s, with an average duration of 2 min 51 s (range, 1 min 30 s to 4 min 35 s). Despite the finding that Doris achieved the acquisition criterion in both prompting procedures within one session of each other, which may suggest that that both prompting procedures are equally efficient, the duration data may suggest that the text-based instructions were more efficient in terms of the average and total duration of teaching sessions. Because the efficiency measures used in the current investigation are provide conflicting information, it is not possible to conclusively assert which prompting procedure is more efficient, as it seems to depend on the measurement system used.

**Janice.** The percentage of independent responding emitted by Janice during the treatment evaluation is depicted in the middle panel of Figure 1. During baseline, moderate levels of independent responding was observed during each tablet-based task. During the prompt-comparison phase, the FaceTime® task was assigned to the video-prompting condition, the YouTube™ was assigned to the text-based instructions condition, and the email task was assigned to the control condition. A similar pattern of responding was observed under both prompting conditions. That is, Janice reached the acquisition criterion in 10 sessions in the video-prompting condition and in 12 sessions in the text-based instructions condition. These data indicate that both prompting procedures were equally effective in promoting independent performance on both tablet-based tasks. In addition, independent responding maintained at 100% at follow up in both the text-based instructions and the video-prompting conditions. Throughout the prompt-comparison phase, independent responding remained stable (43% on each session) during the control condition, which was similar to the level of independent responding observed during baseline. Differentiated responding was observed between the control and both prompting conditions, indicating that Janice's responding in all conditions was not influenced by carry-over effects from the prompting procedures.

Efficiency data for Janice are depicted in Table 3. The total number of teaching sessions in the video-prompting condition was eight and was nine in the text-based instructions condition. The total duration of teaching sessions in the video-prompting condition was 21 min 38 s, with an average duration of 2 min 24 s (range, 1 min 35 s to 3 min 30 s). The total duration of teaching sessions in the text-based instructions condition was 23 min 46 s, with an average duration of 3 min 16 s (range, 1 min 40 s to 4 min 25 s). Results from these efficiency data suggest that video prompting and text-based instructions were roughly equivalent in terms of efficiency.

**Henry.** The percentage of independent responding emitted by Henry is depicted in the bottom panel in Figure 1. During baseline, low to moderate levels of independent responding were observed during each TA. During the prompt-comparison phase, the FaceTime® task was assigned to the video-prompting condition, the email task was assigned to the text-based instructions condition, and the YouTube™ task was assigned to the control condition. Henry's rate of acquisition was faster in the video-prompting condition than in the text-based instructions condition. That is, Henry reached the acquisition criterion in 10 sessions under the video-prompting condition and in 22 sessions under the text-based instructions condition. These data indicate that both prompting procedures were effective in promoting independent performance on both tablet-based tasks; however, responding in the video-prompting condition obtained acquisition in fewer number of sessions. In addition, independent responding maintained at 100% at follow up in both the text-based instructions and the video-prompting conditions. Throughout the prompt-comparison phase, independent responding remained stable (M= 24%; range, 14% and 29%) during the control condition, which was similar to the level of independent responding observed during baseline. Further, differentiated responding was observed between the control and both prompting conditions, indicating that Henry's responding in all conditions was not influenced by carry-over effects from the prompting procedures.

A summary of the efficiency data for Henry are depicted in Table 3. The total number of teaching sessions in the video-prompting condition was eight and was 20 in the text-based instructions condition. The total duration of teaching sessions in the video-prompting condition was 50 min 9 s, with an average duration of 6 min 16 s (range, 4 min 40 s to 7 min 27 s). The total duration of teaching sessions in the text-based instructions condition was 80 min 29 s, with an average duration of 4 min 1 s (range, 2 min 57 s to 6 min 17 s). Results from these efficiency data suggest that video prompting was more efficient than text-based instructions.

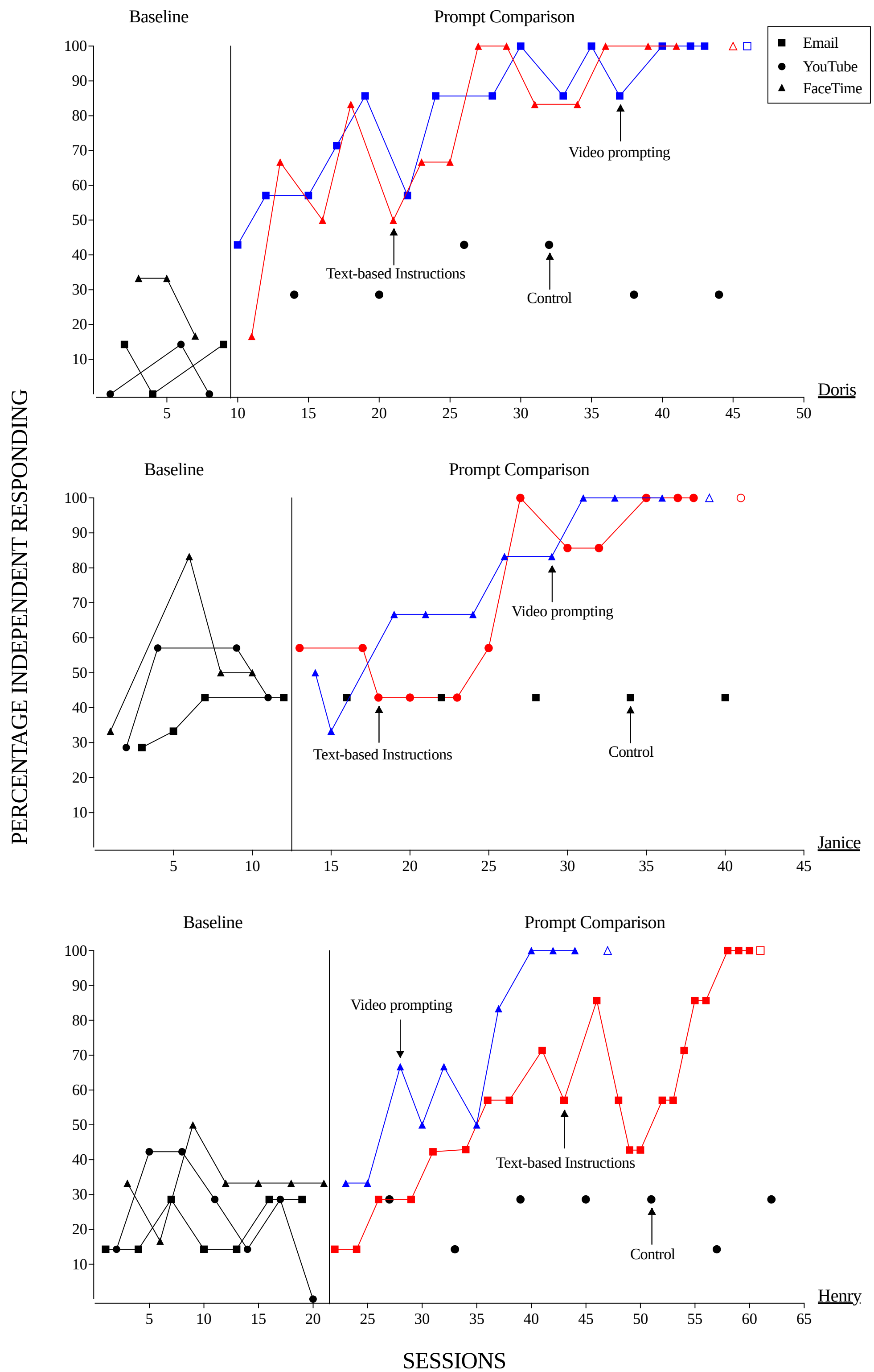


*Figure 1*. Percentage of steps completed independently by Doris (top panel), Janice (middle panel), and Henry (bottom panel) during baseline, prompt comparison of video prompting (depicted in blue) and text-based instructions (depicted in red), and follow-up. The control condition was probed intermittently throughout the prompt-comparison phase.

Table 3

*Summary of efficiency data for teaching sessions for Doris, Janice, and Henry.*

| Participant | Condition | No. sessions to acquisition | Total duration (min:s) | Avg. duration (min:s) |
|---|---|---|---|---|
| Doris | VP | 11 | 48:25 | 4:24 |
| | T-BI | 10 | 28:30 | 2:51 |
| Janice | VP | 8 | 21:38 | 2:24 |
| | T-BI | 9 | 23:46 | 3:16 |
| Henry | VP | 8 | 50:09 | 6:16 |
| | T-BI | 20 | 80:29 | 4:01 |

*Note.* VP = video prompting; T-BI = text-based instructions

**Social Validity Questionnaire**

Results from the social validity questionnaires are depicted in Table 4. The social validity questionnaires addressed three broad categories. The first category consisted of three multiple-choice questions to determine (1) which prompting procedure was preferred, (2) if the participants would use the preferred prompting procedure again in the future, and (3) which prompting procedure was easier to use. Doris preferred text-based instructions over video prompting, reported that she would use text-based instructions again in the future, and found text-based instructions easier to use than video prompting. Both Janice and Henry preferred video prompting over text-based instructions, reported that they would use video prompting again in the future, and found video-prompting easier to use than text-based instructions. The second category consisted of six questions scored on a 5-point rating scale from strongly disagree (1) to strongly agree (5). Questions in this category addressed participants' ratings for each of the prompting procedures in terms of (1) ease of use, (2) helpfulness, and (3) the likelihood that participants would recommend each of the prompting procedures to a friend. On average, participants rated the ease of use for video prompting higher (M = 4.3) than for text-based instructions (M = 3.7), rated the helpfulness of video prompting higher (M = 4.7) than for text-based instructions (M = 3.7), rated the likelihood of recommending video prompting to a friend (M = 4.7) than text-based instructions (M = 4). The third category consisted of two questions on a 5-point rating scale from strongly disagree (1) to strongly agree (5). Questions in this category addressed participants' opinions regarding the appropriateness and relevance of the tablet-based tasks chosen and taught in this study as well as their comfort level with the iPad® following completion of the study. Participants agreed that the tablet-based tasks chosen and taught in this study were relevant and useful to learn (M= 4.7) and all participants strongly agreed that they were more comfortable using an iPad® after completing the study (M= 5). In fact, Doris and Henry purchased an iPad® of their own following completion of the study. Because Janice owned an iPad® prior to the start of the study, she was asked additional questions to determine whether her participation in the study has further influence her iPad® activity. After participating in the study, Janice reported to use her iPad® more to search for and watch videos on YouTube™ (score = 4) as well as for other activities not taught in this study (e.g., reading, playing games; score = 5). In terms of staying connected with friends and family via FaceTime®, Janice reported that she had not set up a FaceTime® account on her iPad® (score = 3).

Table 4

*Summary of social validity questionnaires for Doris, Janice, and Henry.*

| Category | Questions | Participants | | |
|---|---|---|---|---|
| | | Doris | Janice | Henry |
| Category 1 | Which prompting procedure did you like best? | Text-based instructions | Video prompting | Video prompting |
| | Would you use this preferred procedure again? | Yes | Yes | Yes |

| | Which prompting procedure did you find easier to use? | Text-based instructions | Video prompting | Video prompting |
|---|---|---|---|---|
| Category 2[a] | Ease of use | | | |
| | Video prompting | 3 | 5 | 5 |
| | Text-based instructions | 4 | 3 | 4 |
| | Helpfulness | | | |
| | Video prompting | 4 | 5 | 5 |
| | Text-based instructions | 4 | 4 | 3 |
| | Recommend to a friend | | | |
| | Video prompting | 4 | 5 | 5 |
| | Text-based instructions | 5 | 3 | 4 |
| Category 3[a] | Relevance / usefulness of tablet-based tasks | 4 | 5 | 5 |
| | Comfort level with iPad® | 5 | 5 | 5 |

[a] Questions scored on a 5-point rating scale from strongly disagree (1) to strongly agree (5)

## Discussion

The purpose of this study was to compare the effectiveness and efficiency of text-based instructions and video prompting on the independent use of the Internet and ICT skills for older adults. Both video prompting and text-based instructions were found to be effective for all three participants. In terms of efficiency, both prompting procedures were roughly equivalent for two of three participants and video prompting was more efficient for the third participant. That is, both prompting procedures were found to be roughly equivalent for Doris and Janice. However, video prompting was found to be more efficient for Henry. These findings suggest that either prompting procedure can be used to effectively teach older adults to use the Internet and ICT skills; however, the relative efficiency of these prompting procedures is less clear.

The effectiveness and efficiency of these prompting procedures was evaluated to determine the superiority of one prompting procedure over another. A prompting procedure was considered superior if it was effective in obtaining acquisition *and* was more efficient than the other prompting procedure (Smith et al., 2013). In terms of effectiveness, acquisition was obtained in both prompting conditions for all three participants; therefore, indicating that both prompting procedures were effective for all three participants. In terms of the efficiency of the two prompting procedures, both video prompting and text-based instructions were roughly equivalent for Doris and Janice, whereas video prompting was more efficient than text-based instructions for Henry. It should be noted both prompting procedures were considered roughly equivalent for Doris because the acquisition criterion was reached in both prompting conditions within one session of each other. That is, Doris reached the acquisition criterion in the video prompting condition in 15 sessions and in 14 sessions in the text-based instructions condition. Although there was only a one session difference in terms of reaching the acquisition criterion, Doris spent 19 min 54 s longer consuming the prompts in the video prompting condition than she did consuming the text-based instructions. Therefore, if considering the amount of time spent in teaching sessions, these data may suggest that the text-based instruction procedure was more efficient than the video-prompting condition for Doris. Due to conflicting information on Doris' efficiency measures (i.e., number of sessions to acquisition and total duration of sessions), results are inconclusive regarding which prompting procedure is more efficient for Doris. Perhaps one explanation for this discrepancy in efficiency data may be because Doris may have had less experience with video prompting and learning from video demonstrations, more generally. Therefore, one way to capture this information (albeit indirectly) was to compare differences in duration between video prompting and text-based instructions session during the first half and second half of the teaching sessions in the prompt-comparison phase. Results of this evaluation of the duration data revealed that there was a 2 min 10 s difference in the average duration of video prompting sessions from the first half of sessions to the second half of the sessions in the prompt-comparison phase. This difference in average duration seems to suggest the presence of a practice effect. That is, following repeated exposure to the video-prompting condition, it took Doris less time to consume the video prompts (i.e., Doris became more efficient at consuming the video prompts after she had been exposed to six to seven video prompting sessions). In addition, the average duration of video-prompting sessions during the second half were nearly equal to the average duration of text-based instruction sessions during the second half, with only a 30-s difference. Therefore, following brief exposure to video prompting condition, video prompting and text-based instructions may actually be near equal in terms of efficiency for Doris. Another explanation for this discrepant efficiency data may be that the efficiency measures used may not have accurately captured the efficiency of the two prompting procedures. As a result, future researchers should consider taking additional or different efficiency measures. Two possible efficiency measures that future researchers may consider collecting are (a) duration of prompt consumption and (b) frequency of prompt consumption.

Both prompting procedures were also considered roughly equivalent for Janice because she reached the acquisition criterion within two sessions of each other. That is, Janice reached the acquisition criterion in the video prompting condition in 10 sessions and in 12 sessions in the text-based instructions condition. In addition, the difference in total duration of time spent in teaching sessions for both prompting procedures was within 2 min 8 s of each other further suggesting that both prompting procedures were roughly equivalent in terms of efficiency. Henry was the only participant for whom a marked difference in efficiency was observed between the two prompting procedures. That is, Henry reached the acquisition criterion 12 sessions sooner in the video-prompting condition than he did in the text-based instructions condition. In addition, Henry spent 30 min 20 s longer consuming the prompts in the video-prompting teaching sessions than he did in the text-based instructions teaching sessions. Interestingly, the average amount of time Henry spent consuming prompts in the video-prompting teaching sessions was actually 2 min 15 s longer than the average amount of time he spent consuming the prompts in the text-based instructions teaching sessions. Anecdotally, Henry was observed to frequently re-watch the VideoTote chapters several times before completing each step of the TA. Therefore, although video prompting was found to be more efficient in terms of (a) the number of sessions required to achieve the acquisition criterion and (b) the total duration of teaching sessions, Henry actually spent more time consuming video prompts than text-based instructions, on average.

For all participants, experimental control over the prompting procedures was observed. The purpose of collecting data intermittently on the target tasks assigned to the control condition was to determine if participant responding was influenced by carry-over effects, history effects, or maturation effects. An evaluation of the responding on the target tasks assigned to the control condition for all three participants revealed that the level of independent responding during the control condition remained stable from baseline to the prompt-comparison phase for two of three participants but increased slightly for the third participant, Doris. During baseline, Doris never performed the first step of the control task (i.e., tap the YouTube™ icon to open the YouTube™ application) correctly. However, after receiving explicit instruction on how to tap on the FaceTime® icon and how to tap on the email icon during video-prompt and text-based instruction teaching sessions, respectively, Doris performed the first step of the control task correctly on the control task probes during the prompt-comparison phase. These data suggest that some stimulus generalization was observed during the control condition from baseline to the prompt-comparison phase. However, Doris’ independent responding during the control condition within the prompt-comparison phase remained stable demonstrating that responding during both prompting conditions was a function of the prompting procedures themselves, and not a function of carry-over effects, history effects, or maturation effects.

Despite the finding that video prompting and text-based instructions were found to be roughly equivalent for two of three participants, it should be noted that all three participants reached the acquisition criterion for the FaceTime® task first. This could potentially indicate that the FaceTime® task was inherently easier than the other two tablet-based tasks used in the current study; however, two of three participants (Doris and Janice) reached the acquisition criterion on the FaceTime® task within one to two sessions of the other target task. That is, Doris reached the acquisition criterion on the FaceTime® task one session before she reached the acquisition criterion on the email task and Janice reached the acquisition criterion on the FaceTime® task two sessions before she reached the acquisition criterion on the YouTube™ task. If the FaceTime® task was inherently easier than the email and YouTube™ tasks, one might expect a larger difference in the number of sessions to reach the acquisition criterion with the FaceTime® task relative to the other two tasks across all participants. In fact, a logical analysis was conducted prior to the start of the study in order to equate task difficulty across all three tasks. The logical analysis assessed the equality of tasks on three measures: number of steps in the TA, number of seconds to complete each TA, and nature of the movements required in each TA. On two of three measures, the FaceTime® task was found to be (a) identical (nature of movement) to the email and YouTube™ tasks and (b) equal or longer in duration (number of seconds to complete) than the YouTube™ and email tasks, respectively. That is, the finger tap was found to be the same nature of movement for all three tablet-based tasks and the FaceTime® and YouTube™ tasks were both found to take three expert users an average of 27 s to complete, whereas the email task took three expert users an average of 24 s to complete. The only measure on which FaceTime® was found to be slightly different was the number of TA steps. In particular, the FaceTime® task consisted of six TA steps, whereas the email and YouTube™ tasks consisted of seven TA steps. Therefore, the FaceTime® task only consisted of one less step than the other two tasks; however, it was either equal or required more time to complete than the other two tablet-based tasks. Future researchers using an adapted alternating treatments design may consider ensuring that all tasks are perfectly matched on all on all logical-analysis measures.

Another potential limitation of the current investigation is that the FaceTime® task was never assigned as the control condition for any of the participants who completed the study. Initially, the FaceTime® task was assigned to the control condition for a participant named Sarah. Unfortunately, Sarah passed away prior to completing the study; therefore, her data were not reported. When conducting research with older adults, future researchers may consider recruiting additional participants to account for the possibility of attrition.

The outcomes from the current study suggest several areas for further investigation. First, an interesting relationship between prompt preference and prompt efficiency was observed for Henry. That is, video prompting was found to be more efficient for Henry and was also reported to be preferred over text-based instructions. Therefore, future researchers may consider evaluating whether participant preference for a prompting procedure dictates the efficiency with which a participant acquires a task or if efficiency dictates preference for a prompting procedure. Second, the video-prompting condition consisted of a video demonstration of the target task and voice-over instructions and the text-based instructions condition consisted of picture prompts and written instructions. As such, the necessary and sufficient conditions required to produce acquisition of the target tasks is presently unclear. Therefore, future researchers may consider evaluating the necessary and sufficient components of the prompting procedures evaluated in the current investigation. For example, future researchers may consider examining the effects of video prompting with and without voice-over instruction and text-based instructions with and without picture prompts so as to determine the necessary and sufficient components of each prompting procedure required by older-adult learners (Mechling & Gustafson, 2009). In addition, future researchers may consider evaluating methods to increase the efficiency of the prompting procedures. For example, future researchers may consider evaluating the combined used of video prompting and text-based instructions to teach older adults to use the Internet and ICTs (Mechling & Gustafson). Third, although both prompting procedures were demonstrated to be effective for teaching older adults how to use the Internet and ICTs, it is unclear if these prompting procedures would be effective to teach older adults other important skills for their health and well-being. Therefore, future researchers may consider evaluating the effectiveness of video prompting and text-based instructions to teach older adults to operate technologies that support their health, independence, and safety (e.g., telemedicine, sensor technology, and medication management systems).

In summary, two behaviour analytic instructional methods (i.e., video prompting and text-based instructions) were compared to teach older-adult participants to perform tablet-based tasks. To our knowledge, no studies have compared video prompting and text-based instructions in order to determine the superior method of instruction for teaching older-adult learners to use the Internet and ICTs. Given that both prompting procedures were found to be effective and that treatment effects were maintained for both procedures at follow up, the results of the current investigation suggest that either video prompting or text-based instructions can be used to teach Internet and ICT skills to older adults. In addition, both procedures were found to be roughly equal in terms of efficiency for two of three participants. Given these findings, one method that could be used to determine the most appropriate prompting procedure to select for use with older adults might be participant preference. That is, the results of the social validity questionnaire showed that all participants had a distinct preference for one procedure over the other. One of three participants reported a preference for text-based instructions and the remaining two participants reported a preference for video prompting. It is possible that the majority of participants reported a preference for video prompting because video-based instruction offers a dynamic approach to teaching in which instructional methods are interactive, engaging, and more salient for the learner (Mechling & Gustafson, 2009; Tyner & Fineup, 2015). Further, video prompting may help to reduce stimulus overselectivity by the learner by focusing on the relevant stimulus features on the iPad screen (Charlop-Christy, Le, & Freeman, 2000; Mechling & Gustafson). In the current investigation, the video prompt showed a model slowly positioning her finger over the target icon, which may have reduced the likelihood that the participant responded to an irrelevant stimulus feature on the iPad screen. This is particularly relevant given that both Janice and Henry reported that the video-prompting procedure was more clear than text-based instructions given that the model showed them exactly (a) how to complete each TA step and (b) where to touch the iPad® screen before attempting the steps themselves. Although video prompting was preferred over text-based instructions for two of three participants, the efficiency of these procedures across participants was less clear. Therefore, further research is required to compare the efficiency of video prompting and text-based instructions among a larger number of participants and perhaps also across a wider range of skills to determine a superior method of instruction for this population. Both current and future generations of older adults have the potential to benefit from the identification of a superior method of instruction given the continuous nature of technological advancements and society’s reliance on the Internet and ICTs.

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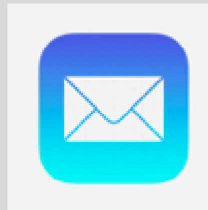
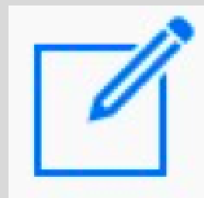
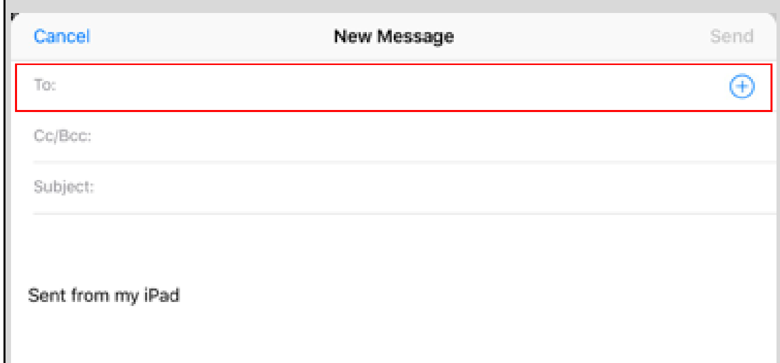
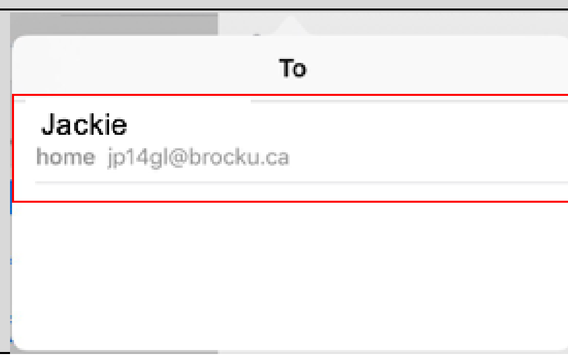
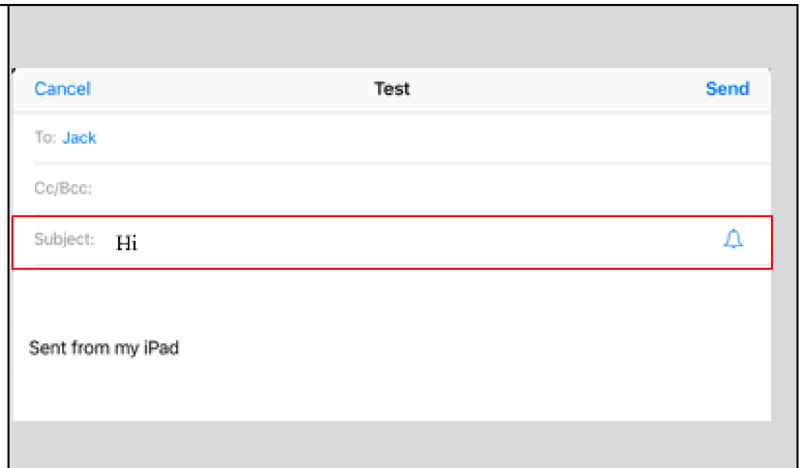
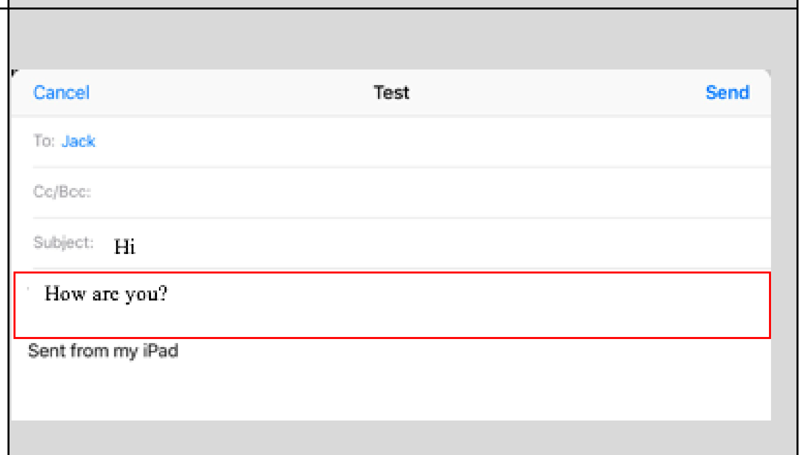
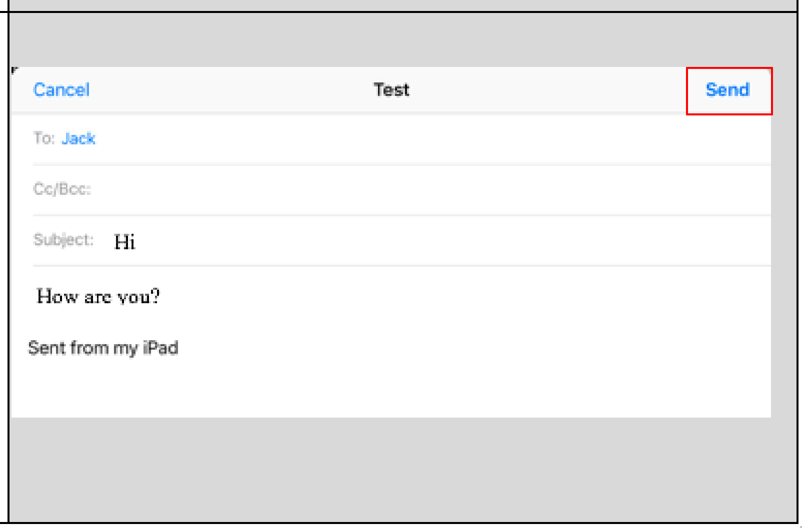
Appendix A

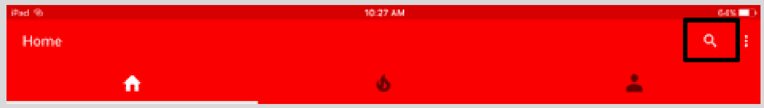
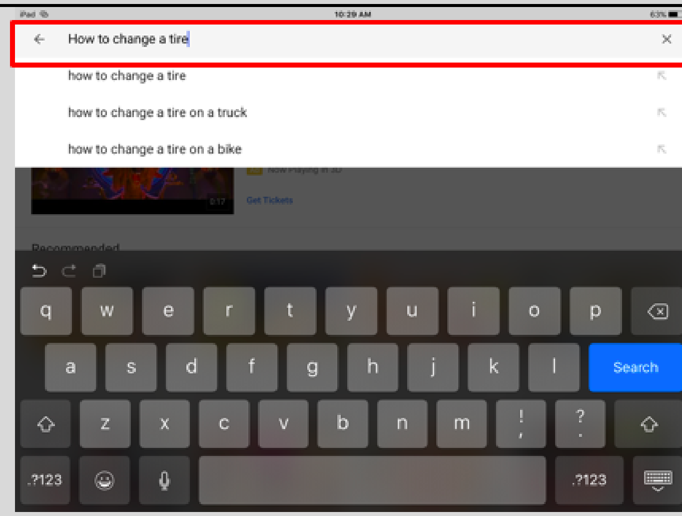
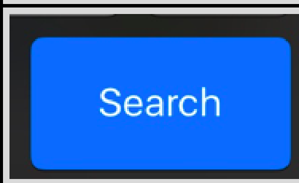
Text-based instructions for sending an e-mail

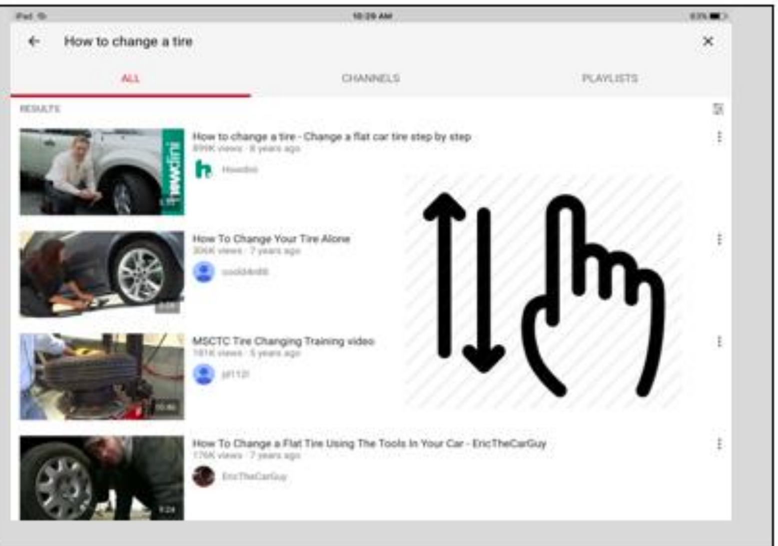
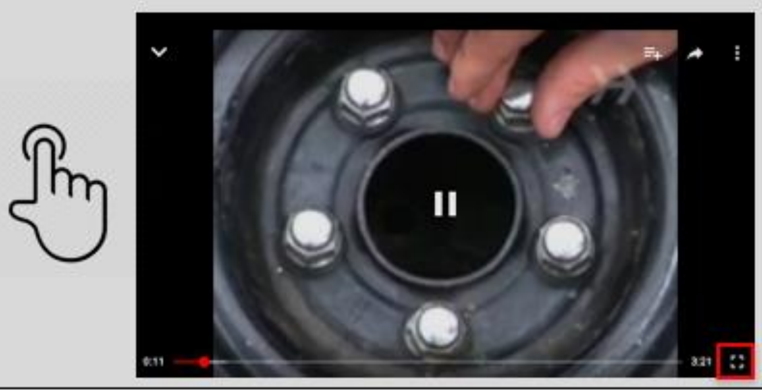
<table>
<tr><td>1</td><td>Tap on the “Mail” application</td><td></td></tr>
<tr><td>2</td><td>Tap the “compose mail” icon located in the top right corner of the screen.</td><td></td></tr>
<tr><td>3</td><td>In the “To:” box, type the name of the person you wish to e-mail using the keyboard. Type “Jackie”.</td><td>
</td></tr>
<tr><td>4</td><td>Tap on the name “Jackie” once it appears.</td><td>
</td></tr>
</table>

| | | |
|---|---|---|
| 5 | Tap on the “subject” box (below the “To:” box) and type in the word, “**Hi**” |   |
| 6 | Tap on the message box (below the subject box) and type, “**How are you?**” |   |
| **7** | Tap on the “send” icon located in the right corner of the screen |   |

## Appendix B

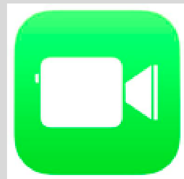
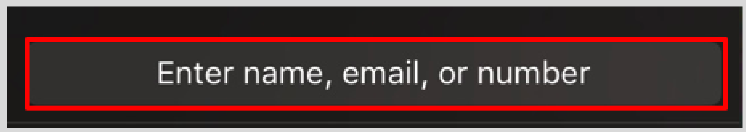
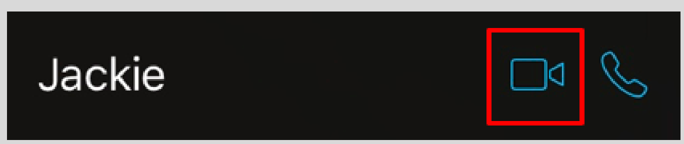
Text-based instructions for searching for a YouTube™ video

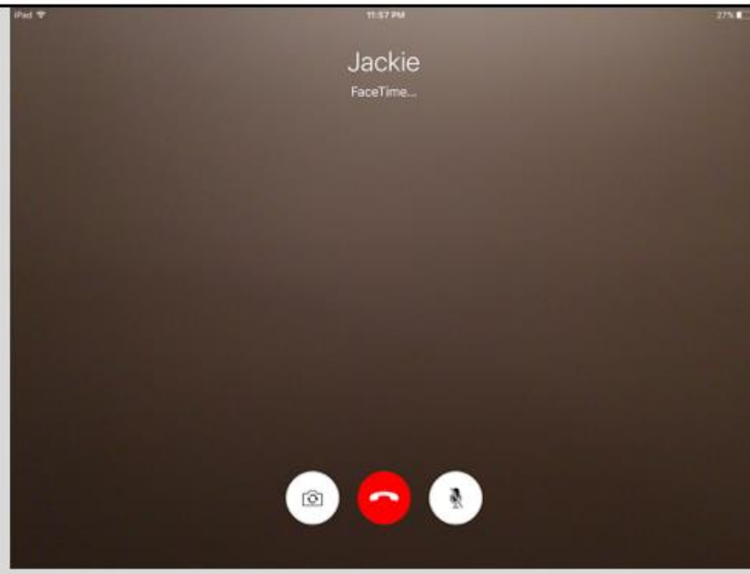
| | | |
|---|---|---|
| 1 | Tap on the "YouTube" application | |
| 2 | Tap the "search" icon located at the top right corner the screen |  |
| 3 | Type some words that describe the video that you want to watch into the search field<br><br>(e.g., if you want to watch a video on how to change a tire, you can type, "how to change a tire") |  |
| 4 | Tap on the blue "search" button located on the the keyboard |  |

| | | |
|---|---|---|
| 5 | Use your index finger to scroll up and down on the screen.<br><br>Tap firmly on the video that you want to watch. |   |
| 6 | Increase the size of the video by tapping on the video screen and then tap on the small square icon located on the bottom right corner of the video screen |   |
| 7 | When you are finished watching, return to your search by tapping on video screen and then tap on the small square icon located on the bottom right corner of the video screen |   |

# Appendix C

Text-based instructions for making a FaceTime® call

| | | |
|---|---|---|
| 1 | Tap on the "FaceTime" application |  |
| 2 | Tap the box at the top of the screen that says "Enter name, email, or number" |   |
| 3 | Type in the name of the person you wish to video call. Type **"Jackie"** |   |
| 4 | Once **"Jackie"** appears, tap the video camera icon located to the right of the name, Jackie |   |

| | | |
|---|---|---|
| 5 | Make sure the camera is facing you and wait for me to answer the video call |  |
| 6 | To hang up the call, tap anywhere on the screen and then press the red phone icon at |  |

# Appendix D

Sample pre-session probe data sheet for the email task

DATA SHEET – EMAIL **(BASELINE / PROBE / CONTROL)**

Subject: _______________ Session Number: _______ Observer: ________________

Date: _________________ Phase (Bsl/ Tx): _____________

Condition (VT, WI, Control, Probe):_________ **Total Duration: ________**

*Start time: _____*

*End time: _____*

| **Step** | **Step Performed? Y/N** | **Type of Error (NR/INC./ Help)** | **Latency to Respond (10-s max)** |
|---|---|---|---|
| 1 | Tap on the "mail" application | | |
| | Y N | NR INC. Help | |
| 2 | Tap the "compose mail" icon located in the top right corner of the screen. | | |
| | Y N | NR INC. Help | |
| 3* | In the "To:" box, type the name of the person you wish to email. Type "Jackie". | | |
| | Y N | NR INC. Help | |
| 4 | Tap on "Jackie" name once it appears. | | |
| | Y N | NR INC. Help | |
| 5 | Tap on the "subject" box (below the "To:" box) and type the word, "Hi". | | |
| | Y N | NR INC. Help | |
| 6 | Tap on the message box (below the subject box) and type, "How are you". | | |
| | Y N | NR INC. Help | |
| 7 | Tap on the "send" icon located on the top right corner of the screen and send the e-mail. | | |
| | Y N | NR INC. Help | |

| **STEPS CORRECT: /7** | **# latency errors (NR):** | **# topography errors (INC.):** | **# requests for help:** |
|---|---|---|---|
| | | | |

**TERMINATED: Y N** **TERMINATION STEP: ______**

***Step 3: Participant selected option before finished typing: Y N***

# Appendix E

Sample teaching-session data sheet for the email task

DATA SHEET – EMAIL **(TEACHING)**

Subject: _______________ Session Number: _______ Observer: ________________

Date: _________________ Phase (Bsl/ Tx/ Probe): _____________

Condition (VT, WI, Control):_________ **Total Duration: ________**

| **Step** | **Step Performed? Y/N** | **Type of Error (INC./ Help)** | |
|---|---|---|---|
| 1 | Tap on the "mail" application | | |
| | Y N | INC. Help | |
| 2 | Tap the "compose mail" icon located in the top right corner of the screen. | | |
| | Y N | INC. Help | |
| 3* | In the "To:" box, type the name of the person you wish to email. Type "Jackie". | | |
| | Y N | INC. Help | |
| 4 | Tap on "Jackie" name once it appears. | | |
| | Y N | INC. Help | |
| 5 | Tap on the "subject" box (below the "To:" box) and type the word, "Hi". | | |
| | Y N | INC. Help | |
| 6 | Tap on the message box (below the subject box) and type, "How are you". | | |
| | Y N | INC. Help | |
| 7 | Tap on the "send" icon located on the top right corner of the screen and send the e-mail. | | |
| | Y N | INC. Help | |
| **STEPS CORRECT: /7** | | **# topography errors (INC.):** | **# requests for help:** |

**TERMINATED: Y N** **TERMINATION STEP: ______**

***Step 3: Participant selected option before finished typing: Y N***

***Step 4: Participant selected option instead of taping on the "search" button: Y N***

Appendix F

Social Validity Questionnaire (non-iPad® Owners)

**Social Validity Questionnaire for non-iPad® Owners**

1. Which prompting procedure did you like best?

   ☐ Text-based instructions ☐ Video-prompting

   a. Would you use this method again? Why or why not?

   ☐ Yes ☐ No

   Why or why not?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

2. Which prompting procedure did you find easier to use?

   ☐ Text-based instructions ☐ Video-prompting

**For the following questions, please indicate the extent to which you agree or disagree with the following statements regarding this study by circling a number that most closely reflects your opinion.**

| Strongly Disagree | Somewhat Disagree | Neutral | Agree Somewhat | Strongly Agree |
|---|---|---|---|---|
| **1** | **2** | **3** | **4** | **5** |

1. I found the Internet technologies and applications taught in this study to be relevant and useful to learn (i.e., FaceTime®, email, YouTube™)
   1 2 3 4 5

2. I found the **text-based instructions** to be helpful.
   1 2 3 4 5

3. I found **text-based instructions** easy to use.
   1 2 3 4 5

4. I am likely to recommend **written instruction** to a friend
   1 2 3 4 5

5. I found the **video-prompting** to be helpful.
   1 2 3 4 5

6. I found **video-prompting** easy to use.
   1 2 3 4 5

7. I am likely to recommend **video-prompting** to a friend.
   1 2 3 4 5

8. After participating in this study, I am more comfortable using an iPad®.
   1 2 3 4 5

Appendix G

Social Validity Questionnaire (iPad® Owners)

**Social Validity Questionnaire for iPad® Owners**

1. Which prompting procedure did you like best?

☐ Text-based instructions ☐ Video-prompting

a. Would you use this method again? Why or why not?

☐ Yes ☐ No

Why or why not?

____________________________________________________________
____________________________________________________________
____________________________________________________________
____________________________________________________________

2. Which prompting procedure did you find easier to use?

☐ Text-based instructions ☐ Video-prompting

**For the following questions, please indicate the extent to which you agree or disagree with the following statements regarding this study by circling a number that most closely reflects your opinion.**

| Strongly Disagree | Somewhat Disagree | Neutral | Agree Somewhat | Strongly Agree |
|---|---|---|---|---|
| **1** | **2** | **3** | **4** | **5** |

1. I found the Internet technologies and applications taught in this study to be relevant and useful to learn (i.e., FaceTime®, email, YouTube™)
   1 2 3 4 5

2. I found the **text-based instructions** to be helpful.
   1 2 3 4 5

3. I found **text-based instructions** easy to use.
   1 2 3 4 5

4. I am likely to recommend **written instruction** to a friend

1 2 3 4 5

5. I found the **prompting** to be helpful.
   1 2 3 4 5

6. I found **video-prompting** easy to use.
   1 2 3 4 5

7. I am likely to recommend **video-prompting** to a friend.
   1 2 3 4 5

8. After participating in this study, I am more comfortable using an iPad®.
   1 2 3 4 5

9. After participating in this study, I use my iPad® to connect with my friends and family using email and/or FaceTime®.
   1 2 3 4 5

10. After participating in this study, I use my iPad® to search for and watch videos on YouTube™.
    1 2 3 4 5

11. After participating in this study, I use my iPad® for activities other than online communication (e.g. reading, watching a video, playing games) more often than I did before participating in this study.
    1 2 3 4 5

# Appendix H

## Certificate of Ethics Clearance

Brock University
Research Ethics Office
Tel: 905-688-5550 ext. 3035
Email: reb@brocku.ca

Social Science Research Ethics Board

### Certificate of Ethics Clearance for Human Participant Research

| | | | |
|---|---|---|---|
| DATE: | 7/31/2015 | | |
| PRINCIPAL INVESTIGATOR: | ZONNEVELD, Kimberley - Centre for Applied Disability Studies | | |
| FILE: | 14-265 - ZONNEVELD | | |
| TYPE: | Masters Thesis/Project | STUDENT:<br>SUPERVISOR: | Jacqueline Pachis<br>Kimberley Zonneveld |

TITLE: Comparison of Prompting Procedures to Teach Internet and Information and Communications Technology to Older Adults

**ETHICS CLEARANCE GRANTED**

Type of Clearance: NEW Expiry Date: 7/31/2017

The Brock University Social Science Research Ethics Board has reviewed the above named research proposal and considers the procedures, as described by the applicant, to conform to the University's ethical standards and the Tri-Council Policy Statement. Clearance granted from 7/31/2015 to 7/31/2017.

The Tri-Council Policy Statement requires that ongoing research be monitored by, at a minimum, an annual report. Should your project extend beyond the expiry date, you are required to submit a Renewal form before 7/31/2017. Continued clearance is contingent on timely submission of reports.

To comply with the Tri-Council Policy Statement, you must also submit a final report upon completion of your project. All report forms can be found on the Research Ethics web page at http://www.brocku.ca/research/policies-and-forms/research-forms.

In addition, throughout your research, you must report promptly to the REB:

a) Changes increasing the risk to the participant(s) and/or affecting significantly the conduct of the study;
b) All adverse and/or unanticipated experiences or events that may have real or potential unfavourable implications for participants;
c) New information that may adversely affect the safety of the participants or the conduct of the study;
d) Any changes in your source of funding or new funding to a previously unfunded project.

We wish you success with your research.

Approved: J. Frijt

Jan Frijters, Chair
Social Science Research Ethics Board

**Note:** Brock University is accountable for the research carried out in its own jurisdiction or under its auspices and may refuse certain research even though the REB has found it ethically acceptable.

If research participants are in the care of a health facility, at a school, or other institution or community organization, it is the responsibility of the Principal Investigator to ensure that the ethical guidelines and clearance of those facilities or institutions are obtained and filed with the REB prior to the initiation of research at that site.