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# Establishment of Asynchronous Rapport with Test Administrator: A Comparison of Online and In-Person Testing Procedures

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Establishment of Asynchronous Rapport with Test Administrator:

A Comparison of Online and Paper-and-Pencil Testing Procedures

By

Natalie Frost

A Thesis  
Submitted to the Faculty of Graduate Studies  
through the Department of Psychology  
in Partial Fulfillment of the Requirements for  
the Degree of Master of Arts  
at the University of Windsor

Windsor, Ontario, Canada

2015

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Establishment of Asynchronous Rapport with Test Administrator:

A Comparison of Online and In-Person Testing Procedures

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September 15, 2015

## DECLARATION OF ORIGINALITY

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## ABSTRACT

Rapport is often established with clients prior to psychological testing to facilitate self-disclosure and ease anxiety. Test administrators need to find ways to build rapport with clients prior to online tests. The present study examined whether asynchronous rapport, a positive relationship established without real-time interaction, could form between an online test administrator and participants. This study examined the effects of a rapport-building procedure prior to, and consistency of scores on, online and offline measures. Separated by a one-week interval, undergraduate students completed both online and paper-and-pencil versions of measures of perceived rapport, self-disclosure, social and state anxiety. Participants were randomly assigned to either an asynchronous rapport condition (an online video and in-person script presented by the test administrator to foster rapport) or no rapport condition. Results suggest that asynchronous rapport-building, online test administration, and social anxiety were related to amount of self-disclosure. Implications for online test delivery are discussed.

## DEDICATION

To my loving husband, Eric.

Though I was the dreamer, you were the one to help make my dreams a reality.

## ACKNOWLEDGEMENTS

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## CHAPTER 1

### INTRODUCTION

The expanding technological knowledge of psychologists has brought online and computer-based psychological services into society. These online services have potential benefits for certain groups of individuals who may face challenges of access to quality psychological care. For example, online testing may be more accessible, convenient, and preferable for Canadians in rural areas than having to schedule traditional paper-and-pencil tests. Because of these perceived benefits, research is needed to ensure that online testing is being provided in the most effective way.

Until the 1990s, research examining online psychological services was limited. Since then, researchers have demonstrated the validity of some online psychological services that have become increasingly popular with clients (Khanna & Kendall, 2008; Sánchez-Ortiz et al., 2011; Spence et al., 2011). Over the years, online psychological services have been delivered in synchronous and asynchronous formats depending on whether the interactions between the client and therapist occur in real-time or not. More recently, researchers have examined the benefits of transforming paper-and-pencil psychological tests to valid online tests. It cannot just be presumed that online formats of tests have the same psychometric properties as their paper-and-pencil counterparts (Buchanan et al., 2005; Fouladi, McCarthy, & Moller, 2002), but current research is beginning to support the idea that many paper-and-pencil tests maintain their validity when administered in an online format (Holländare, Askerlund, Nieminen, & Engstrom, 2008; Kane, Walker, & Schmidt, 2011; Vallejo, Jordán, Diaz, Comeche, & Ortega, 2007; Zlomke, 2009).

It is also important to consider the difference in method of administration between online and paper-and-pencil tests. A key component of in-person psychological test administration is the quality of the relationship between the client and test administrator. Establishing a positive relationship with the client by building rapport allows clients to feel more comfortable discussing sensitive topics and being evaluated by a test administrator prior to an assessment (Sattler & Ryan, 2009). Potential reductions in anxiety in the moments prior to testing may facilitate greater self-disclosure during testing. Although researchers have demonstrated that positive relationships can be developed between therapists and clients in an online therapeutic environment (Prado & Meyer, 2006), it is currently unknown whether rapport can be established online between a client and test administrator prior to Internet-based testing without a real-time interaction (asynchronous rapport).

The goals of the present study were to examine the effects of asynchronous rapport on, and the consistency of, online and paper-and-pencil measures of self-disclosure, anxiety, and perceived rapport with the test administrator. This study built upon the research of online therapy and the therapeutic alliance to explore participants' perceptions of an online test administrator and how that affects their responses. Though test administrators are encouraged to build rapport with clients prior to in-person testing and interviewing, research has yet to examine the role of rapport in an online environment and its potential ability to reduce anxiety, facilitate self-disclosure, and form a positive relationship with the test administrator prior to online testing. Research on rapport and the benefits and concerns of online testing will be discussed in the following sections.

## CHAPTER 2

### LITERATURE REVIEW

#### **Online Therapeutic Services**

Therapeutic services provided by therapists over the Internet to clients have numerous aliases, such as Internet therapy, cybercounseling, E-therapy, and online therapy. Services are offered in both synchronous and asynchronous formats. Synchronous interactions require the client and therapist to be present and have a cooperative interaction in real-time. Some examples of synchronous services are: online audio, instant messaging, Skype, and the use of webcams. In contrast, asynchronous interactions do not occur in real-time and are more like exchanges through e-mail than an active social interaction. E-mail, online forums, and web consulting are examples of asynchronous services. Whereas only 46 to 52 percent of online therapists use synchronous chat, approximately 75 to 82 percent of online therapists use e-mail to communicate and conduct therapy with clients (Laszlo, Esterman, & Zabko, 1999; Maheu & Gordon, 2000). Perhaps asynchronous service allows the client and therapist to have a flexible schedule and gives them more time to reflect on responses, which is not always possible in synchronous service.

**Effectiveness of online therapy.** A meta-analysis by Barak, Hen, Boneil-Nissim, and Shapira (2008) reviewed fourteen studies that directly assessed the effectiveness of asynchronous and synchronous online therapies compared to face-to-face therapies and found that they were equally effective when measured by expert raters and self-report questionnaires. Furthermore, no differences in effect size were found between synchronous and asynchronous online therapy (Barak et al., 2008). Interestingly, online

audio (without video), instant messaging, and e-mail therapies had larger effect sizes than webcam therapy (Barak et al., 2008). This suggests that even when there are no visual social cues between the therapist and client, online therapy can still be effective.

Researchers have also found that during both face-to-face and online therapy similar positive therapeutic alliances between clients and therapists can be formed (Knaevelsrud & Maercker, 2006).

Asynchronous online therapy is similar to asynchronous online testing because they both involve the exchange of personal information online between the client and therapist and the test administrator is absent and does not provide real-time feedback. Based on Barak and colleagues' (2008) research, it is possible that information gathered from online testing that does not require real-time direction from an administrator may be equally effective as in-person testing, assuming the psychometric properties of the test remain stable. Thus, one purpose of the present study is to examine the reliability of online tests in comparison to the original paper-and-pencil formats of the tests.

### **Concerns About Internet Testing**

The implementation of online testing as a common practice is being approached cautiously by psychologists. Using computers as a method of test administration has brought new ethical concerns that have never been warranted before. Many of these concerns are similar to the concerns about online counselling, such as technological reliability, lack of communication cues, credentialing and training, and relationship development issues with the psychologist (Sampson, Kolodinsky, & Greeno, 1997; Suler, 2000). The major concerns regarding Internet testing will be discussed in detail below.

**Technological reliability.** Technology cannot always be counted on to perform tasks in the desired manner. Computers may fall victim to technical difficulties and viruses. Furthermore, online communication brings with it its own risks to confidentiality. Transferring personal information over the Internet has the chance to be hacked or lost. Finally, the identity of the individual completing test questions cannot always be relied upon or discerned when tests are completed online.

Fortunately, many of these concerns can be addressed by using appropriate computer and Internet security programs and having a backup plan with the client if technological difficulties arise (e.g., offering the alternative of a telephone interview, rescheduling). Furthermore to ensure that the client is the one completing the questionnaires, some psychologists use code words to limit the chances of imposters taking online tests (Canadian Psychological Association, 2013; National Board for Certified Counselors, 2012).

**Communication cues.** A major concern about online psychological services is that psychologists using this method of communication do not have the benefit of using their clients' verbal, visual, and physical cues (Alleman, 2002). Face-to-face test administration allows the test administrator to note clients' expressions of distractibility, frustration, and distress that may affect test scores. For example, a test administrator may notice that the client is looking away from the test materials and not concentrating on the task. This distraction may affect the client's performance on working memory and timed tasks. In response, the test administrator may direct the client's attention back to the task to maintain the validity of the test results. Similarly, if a client displays emotional distress during testing (e.g., crying), the test administrator can observe this and may take into

consideration that the client's heightened state of arousal might be negatively affecting their performance (Teigen, 1994). Therefore, if online test administrators do not have access to the client's expressed mood and behaviours throughout the testing, the concern is that they may be missing cues that would help them determine if the test is a valid measure of the client's performance.

Test administrators also lack control over the testing environment when a client completes tests online. If clients are frequently leaving their computer, listening to something simultaneously, multitasking, or if someone else is in the room, these factors may affect their test results. For example, performance on in-person intelligence and reading comprehension tests have been shown to be significantly poorer while simultaneously listening to background music compared to performing in silence (Dobbs, Furnham, & McClelland, 2011; Purham & Currie, 2014). Furthermore, most psychological tests used standardized procedures during development to assess reliability, validity, and compile norms of the test results. If participants take frequent breaks or are distracted, the procedure is no longer standardized and results may be only cautiously compared to a normative group. Inaccurate test results may lead to misdiagnoses, inappropriate education plans, and/or poor resource allocation.

**Credentialing and training.** Alongside the concerns about the online format of tests, there is the question of who is qualified to provide online tests. In-person psychological tests are typically administered by a licensed psychologist or psychological associate. However, their credentials do not necessarily qualify them to administer online tests. Psychologists also need to be educated in how to communicate effectively online, how to create secure therapy websites, and how to develop a positive relationship with

the client online. As of yet it is not mandatory for universities to train graduate psychology students in online assessment or counselling. At some universities there are courses or certificate programs in online counselling, but these programs are not accredited by the Canadian Psychological Association (CPA).

Fortunately, the CPA has drafted a set of ethical guidelines for psychological services that are provided online (Canadian Psychological Association, 2013). These ethical guidelines create a framework to regulate how psychologists should communicate, treat, and deliver services to clients safely online. Twenty-three guidelines were developed and categorized in accordance with the four ethical principles of CPA: respect for dignity of persons, responsible caring, integrity in relationships, and responsibility to society. The first principle emphasizes the need to educate clients on the benefits and risks of online services, including potential confidentiality limitations of information sent online. Clients may seek online services because of their convenience but it is important that they are aware of the limitations so that they can make an informed decision regarding their psychological service needs. The second principle contains four guidelines for responsible caring that requires psychologists to: (a) refrain from performing psychological services online until they have demonstrated competency in service delivery in-person, (b) determine if other psychological services would benefit the client more, (c) keep up to date on the effectiveness research of online services, and (d) develop an online service plan in accordance with the client's needs. These guidelines ensure that online psychologists are knowledgeable and competent in providing effective services to clients and reduce the chance of worsening clients' problems. The third principle requires psychologists to set boundaries regarding their availability online, and

to be licensed in their own jurisdiction, as well as the clients' jurisdiction. The final principle emphasizes the need to abide by laws in the client's jurisdiction and by online test copyright laws. These last two principles ensure that psychologists are being held accountable for their services through their licensing board, as well as societal laws. It is expected that these guidelines will be officially included in the upcoming CPA code of ethics, although they are not currently included.

In addition to the CPA, other organizations have also created ethical guidelines for the practice of online psychological services. The National Board for Certified Counsellors (NBCC) was the first organization to develop a set of ethical guidelines to address concerns about online psychological services (National Board of Certified Counselors, 2012). The NBCC Policy Regarding the Provision of Distance Professional Services is the most recent update of these guidelines (National Board of Certified Counselors, 2012). The guidelines mirror those presented earlier from the CPA's draft with a few additions. Specifically, NBCC counsellors must also maintain a secure backup system for digital communication, never use social media to communicate with clients, and provide clients with information regarding their credentials and locations at which clients can access free Internet.

Despite the concerns associated with online test administration, it could be argued that these are no more disconcerting than risks taken in face-to-face test administration (Skinner & Zack, 2004), such as physical harm to client or therapist. In fact, the benefits, such as creating new opportunities to reach other populations, may outweigh the concerns. It is also reassuring that psychological organizations are aware of these

potential problems with online services and are creating ethical guidelines to limit them.

### **Benefits of Online Testing**

Much of the research on the benefits of online psychological services has been conducted in the context of online therapy. Online therapy has been shown to have numerous benefits for the psychologist and the client (Barak, Boniel-Nissim, & Suler, 2008; Cook & Doyle, 2002; Young, 2005), and these benefits may not only be applicable to online testing, but may also give online testing an advantage over traditional paper-and-pencil tests. Some of the proposed advantages that online testing has over paper-and-pencil and in-person testing are anonymity, increased self-disclosure, convenience, and accessibility. The proposed benefits of online testing will be discussed in more detail below.

**Convenience and accessibility.** A major reason that clients choose to partake in online psychological services is because of their convenience (Chester & Glass, 2006; Haberstroh, Duffey, Evans, Gee, & Trepal, 2007; Young, 2005). Online therapy and online testing allow clients to remain in their own home while receiving services, thus eliminating travel expenses and travel time to a clinician's office. In order for psychological services to be useful, individuals have to be able to access them. The Internet can be accessed almost anywhere, and many Canadians have Internet access at home. In 2012, 83% of Canadians reported having access to the Internet within their own home (Statistics Canada, 2013a). Individuals who don't have Internet access at home are usually still able to access it at local community service buildings, public libraries, Internet cafes, schools, and many other locations. Not only is the Internet available nearly everywhere, but it also offers more flexible scheduling for clients. This allows the clients

who are unable to get time off work or clients who care for young children more flexibility in scheduling services. Clients who are unable to schedule appointments in an office during typical work hours may still have access to online psychological services during the evenings and weekends (Rochlen, Zack, & Speyer, 2004). However, if the test administrator is required to establish rapport using synchronous, real-time communication with clients (e.g., Skype), the scheduling of online testing may still be limited to the times the administrator is available and not when the clients are available. This suggests that asynchronous testing may be the most convenient delivery method.

The accessibility of online psychological services may be most valuable to clients living in rural communities who may not have access to a licensed psychologist in their area. Though an estimated 19 to 31 percent of Canadians live in rural areas, only 10 percent of Canadian physicians and 5 percent of Canadian psychologists provide services to rural areas (Canadian Psychological Association, 2011; Society of Rural Physicians of Canada, 2015). Fortunately, most of those living in rural areas have access to the Internet (Canadian Radio-television and Telecommunications Commission, 2010). The Internet greatly expands the geographical boundaries of psychological testing services. Furthermore, it allows the opportunity for increasing the range of expertise to which clients have access (e.g., services from a licensed child psychologist versus an unlicensed psychotherapist; Young, 2005).

Finally, online psychological testing can be more accessible than in-person testing for individuals with mobility, physical, language, and hearing disabilities (Barak & Sadovsky, 2008; Mallen, Vogel, Rochlen, & Day, 2005; Rochlen et al., 2004). For example, individuals with hearing disabilities may struggle to find a sign-language

translator for testing in their area, but can find someone online. Research has found that individuals with hearing disabilities use the Internet more, in general and for online communication, than do individuals without hearing disabilities (Barak & Sadovsky, 2008). This suggests that online communication with a test administrator, and potentially online testing, may be more preferable than in-person testing for clients with hearing impairments.

**Anonymity.** For some individuals, there is still a significant stigma about seeking psychological services, and the fear of stigmatization is one of the most common reasons they choose not to seek psychological help (Corrigan, 2004). For this reason, clients may wish to maintain as much anonymity as possible when receiving psychological services. There is much more to anonymity than just not having one's name identified. Lapidot-Lefler and Barak (2012) believe that anonymity also refers to being unidentifiable with regards to appearance, gender, weight, age, ethnicity, and other personally identifying features. Clients who are concerned about being judged by others for seeking psychological help, or being seen at a psychologist's office (e.g., parking at or getting off the bus at a psychologist's office), may be more inclined to seek assistance from someone who cannot see or hear them in real time.

Furthermore, clients may react to therapists' verbal and visual behaviours that they perceive as negative reactions to their responses, such that they develop feelings of inferiority and distrust towards the therapist. Negative impressions and feelings towards the therapist can deter the development of a positive relationship between the client and therapist. Suler (2004) introduced the concept of invisibility, similar to anonymity, which may reduce the impact of reactivity and fear of judgment on the therapeutic alliance.

Invisibility is the ability to conceal facial expressions (e.g., frown), physical movements (e.g., sneezing), appearance, and vocal reactions (e.g., sighing) from a communication partner online. This is similar to Freud's psychoanalytic therapy whereby clients would lie down on a couch and the therapist would sit out of the client's sight (Freud, 1913), creating a form of invisibility. Online therapy and testing allow both the client and examiner to be invisible during an interaction, which may foster a more positive test administrator-client relationship. For the purpose of this research, invisibility will be incorporated as a part of the larger concept of anonymity.

Anonymity can greatly affect how individuals choose to respond (i.e., in a socially desirable way or honestly). Social desirability can severely impact the internal validity of psychological testing because it forms a misrepresentation of participants' true responses (Hathaway & McKinley, 1989; Huang, Liao, & Chang, 1998; Nederhof, 1985). A study by Joinson (1999) manipulated test format (online vs paper-and-pencil) and anonymity (anonymous vs non-anonymous) to examine participants' levels of social desirability. Participants in the anonymous condition were instructed that their scores could not be linked to them but participants in the non-anonymous condition were required to put their name on the test. Approximately half of the participants completed the self-report social desirability measure online and the other half completed the paper-and-pencil format. Joinson found that participants who were anonymous had significantly lower social desirability scores than those who were not anonymous. Similarly, participants who completed the measure online had significantly lower social desirability scores than those who completed the paper-and-pencil format. He also found that participants who completed the measure online and were anonymous had the lowest

social desirability scores. This study suggests that clients who can maintain some anonymity and complete psychological tests online may be less likely to respond in a socially desirable way, thus contributing to the validity of the test results.

**Online disinhibition effect and self-disclosure.** Other studies (e.g., Joinson, 2001b; Spears, Lea, Corneliussen, Postmes, & ter Haar, 2002; Tanis & Postmes, 2007) have demonstrated how anonymity can elicit online disinhibition that assists psychologists with gathering important information from clients. In the past few decades researchers started to notice a discrepancy between research participants' amount of self-disclosure online, in-person, and on paper-and-pencil measures (Hart & Goldstein, 1985; Kiesler, Siegal, & McGuire, 1984; Levine, Ancill, & Roberts, 1989; Robinson & West, 1992). In response to this discrepancy, Weisband and Kiesler (1996) conducted a meta-analysis that reviewed 39 studies on the amount of self-disclosure of personal information using computer, in-person interview, and paper-and-pencil methods of test administration. They found the highest levels of self-disclosure occurred when tests were administered on a computer with no one else in the room.

It wasn't until 2004 that John Suler coined the term *online disinhibition effect* to describe the unusually high amount of online expression and disclosure. This effect can be defined as a decrease in behavioural inhibitions online (that can lead to greater self-disclosure) that are thought to be fostered by anonymity (Suler, 2004). In accordance with Altman and Taylor's (1973) social penetration theory, greater self-disclosure may improve the quality of the relationship between the test administrator and client from which a positive, cooperative testing environment may be created. Increased self-

disclosure also allows the test administrator to make more informed decisions about the clients' needs based on the greater amount of relevant personal information.

A study by Joinson (2001b) demonstrated the online disinhibition effect on participants' amount of self-disclosure. Forty undergraduates were paired and given a dilemma to discuss and form a collaborative answer. Half of the dyads completed the task face-to-face and the other half completed it using online chat in separate rooms. Transcripts of the discussion were analyzed for spontaneous self-disclosure of personal information. It was found that participants spontaneously disclosed more information about themselves to a stranger when communication was online than when communication was face-to-face. The results of this study may be applied to psychological testing, whereby online test formats may facilitate the amount of relevant personal information clients choose to disclose to the test administrator.

It is not only the amount of information disclosed that is important for clinical assessment but also the depth of communication. There are two forms of verbal information given about oneself in conversations: breadth of communication and depth of communication. Breadth refers to the disclosure of numerous facts about oneself in a variety of areas, whereas depth refers to the disclosure of intimate facts about oneself that are not commonly discussed. Valkenburg and Peter (2007) examined the perceived breadth and depth of online communication with friends of 665 students, ages 10 to 16, using self-report questionnaires. They found that 25% of participants reported breadth of communication with friends was easier to convey online than face-to-face communication, and 30% reported depth of communication with friends was easier to convey online (Valkenburg & Peter, 2007). Furthermore, although adolescent girls have

been shown to have more breadth and depth when disclosing information face-to-face to another person than do adolescent boys (McNelles & Connolly, 1999), other research suggests this discrepancy is not found for online interactions (Valkenburg & Peter, 2007). Results from these studies suggest that some clients—regardless of gender—may find online testing to be a more effective medium to communicate personal facts about themselves. The present study will examine participants' comfort self-disclosing information online, as well as how their perceptions of an online test administrator facilitates, or hinders, self-disclosure.

In sum, online psychological testing potentially offers unique benefits to clients and test administrators such as anonymity, greater self-disclosure, convenience, and accessibility. Perceived anonymity reduces clients' fear of being judged negatively by others for seeking psychological services and facilitates open discussion of sensitive, personal information. Similarly, client reactions that may invalidate test results, such as socially desirable responding, may be less likely to occur online, and self-disclosure to the test administrator may be greater in breadth and depth due to the online disinhibition effect. Greater self-disclosure of intimate information enables test administrators to form a trusting relationship with clients and better understand the clients' unique needs. Finally, online testing can be more convenient regarding scheduling and is more accessible to clients across the country. These benefits of online testing may be particularly valuable to clients with learning disabilities, Attention Deficit/Hyperactivity Disorder (ADHD), social anxiety, and clients that prefer communicating online.

## **Online Clients**

**Clients with learning disabilities or ADHD.** Many individuals with disabilities turn to the Internet for information and advice. One population of clients that frequently seek assistance online is those with learning disabilities. For example, *LD OnLine* created one of the most popular websites for individuals seeking information for learning disabilities ([www.ldonline.org](http://www.ldonline.org)). It has provided online information to over two million website visitors each year and has over 79,000 newsletter subscribers (LD OnLine, 2009). The popularity of online resources for learning disabilities is expected because the most commonly occurring disabilities in Canadian school-aged children are learning disabilities (Statistics Canada, 2006). A disorder highly comorbid with learning disabilities is ADHD. ADHD is found in approximately 5% of children and approximately 2.5% of adults (American Psychiatric Association, 2013).

It is common for access to assistive educational resources and educational plans to be limited for the individuals with disabilities until psychological tests are administered to reveal their specific learning deficits. Online measures may also benefit individuals with learning disabilities and ADHD who are self-conscious or hesitant to reveal potential limitations. By allowing them to take tests alone and within their own home, they may feel less vulnerable. If psychologists are able to make valid diagnoses for students using online tests for learning disabilities and ADHD (such as the Reynolds Adaptable Intelligence Test and Basic Achievement Skills Inventory), rather than the traditional paper-and-pencil tests, educational plans and assistive resources may be implemented sooner. Multi-Health Systems Inc. (MHS), a publisher of psychological tests, has recognized the need to make tests for ADHD more accessible (e.g., Conners' 3,

Behavior Intervention Monitoring Assessment System, Comprehensive Executive Function Inventory). To meet this need, they have created a way for psychologists to administer tests to clients via a website ([www.mhsassessments.com](http://www.mhsassessments.com)). Though they have recently made the tests available online, research is still needed regarding how this format of service delivery may influence responses.

**Clients with social anxiety.** Another client population that may benefit from online screening and testing is those who are at risk of or who have social anxiety. Social anxiety disorder is characterized by an overwhelming fear of, avoidance of, and distress in social situations during which one may be evaluated by others (American Psychiatric Association, 2013). Because of the fear associated with being evaluated during a conversation, social anxiety can significantly impact information gathering required for psychological testing when done in person. Social anxiety may inhibit how much personal information clients feel comfortable disclosing to a test administrator with whom they are not familiar. It may also affect the quality of the relationship between the test administrator and client due to the client's unease during face-to-face social interactions.

Research has just begun to explore social anxiety's role in online self-disclosure and online relationship formation. Valkenburg and Peter (2007) examined adolescents' use of online communication with friends. They found that those who had high social anxiety viewed the Internet as a valuable place to disclose personal information, more so than adolescents with low social anxiety. Similarly, Joinson (1999) found that non-clinical participants reported lower social anxiety scores when questionnaires were completed online compared to paper-and-pencil. Social anxiety may also moderate the

relationship between online communication and self-disclosure, whereby online communication accounts for significantly more variance in self-disclosure among those with high social anxiety than those with low social anxiety (Wang, Jackson, & Zhang, 2011). Therefore, for individuals with high social anxiety, test administration and information gathering may be more successful online than face-to-face.

Furthermore, a positive relationship has been found such that the greater the severity of social anxiety, the more individuals prefer talking online rather than face-to-face (Pierce, 2009). For example, a study conducted by Tian (2013) built on previous research findings of online communication to examine social anxiety's role on self-disclosure and relationship formation via online blogging. Bloggers who had high social anxiety disclosed deeper personal information and sought online relationships more than did those with low social anxiety.

In conclusion, the literature suggests that individuals with high social anxiety hold positive attitudes towards online interactions and engage in more online self-disclosure than do those with low social anxiety. It is possible that the Internet may foster a positive testing environment that is better than face-to-face testing for those with social anxiety and may reduce the social interaction barrier to help-seeking for these individuals.

**Clients with online service preferences.** Individuals seeking psychological services tend to be parents of children, and students, between the ages of seven to mid-twenties. Many of these students were born in the 1980s to early 2000s and are a part of Generation Y (also known as the Millennials). Individuals in Generation Y grew up in a technological society and are recognized for their technological competency (Greenfield & Yan, 2006). Research has suggested that 94% of Canadians age 45 and younger and

99% of Canadians age 9 to 17 use the Internet (EnviroNics Research Group, 2001; Statistics Canada, 2010). Therefore Canadian postsecondary students are likely frequent users of the Internet for communication using e-mail, Facebook, Twitter, Instagram, LinkedIn, and other social media sites (Statistics Canada, 2010).

Online testing may be the most accessible and effective format for today's clients because of their experience growing up in a technological society. Research has shown that those who hold positive attitudes towards online therapy tend to be more comfortable using the Internet and computers (Leibert, Archer, Munson, & York, 2006; Wangberg, Gamon, & Spitznogle, 2007). Similarly, Skinner and Latchford (2006) found that clients participating in online support groups had significantly more positive attitudes about the idea of participating in online therapy than face-to-face therapy. Participants liked the idea of being able to use computers to communicate with a therapist at a convenient time, being distant, anonymous, and not able to see the therapist. Online communication is becoming more accepted in society. This suggests that psychologists may need to take these communication preferences into account when deciding on the best treatment options for today's clients and how to use their communication preferences to establish a positive relationship.

### **Therapeutic Alliance**

Establishing a positive relationship with clients is a central part of providing psychological services. One way to positively connect with clients is by forming a therapeutic alliance. The therapeutic alliance (also known as working alliance or helping alliance) is defined as a "collaborative relationship between client and therapist in therapy" (Horvath, 2001, p. 365) and has been shown to be a reliable predictor of positive

therapy outcome (e.g., symptom reduction) for in-person therapy (Horvath & Symonds, 1991; Martin, Garske, & Davis, 2000). It is often established within the first three sessions of therapy and has been shown to be stable across sessions (Hilsenroth, Peters, & Ackerman, 2004; Salzman, Luctgert, Roth, Creaser, & Howard, 1976).

Bordin (1979) operationalized the therapeutic alliance as consisting of goals, tasks, and bond. Goals are what the client hopes to achieve through therapy. Clients need to self-disclose personal information to the therapist to collaboratively determine what they will strive to achieve in therapy. Tasks are the agreed upon steps between the therapist and client that will bring the client closer to reaching their goals. The therapeutic bond is the trusting relationship between the client and therapist that will enable them to collaboratively work towards the goals. It is imperative that therapists establish a trusting relationship so that clients can feel comfortable disclosing sensitive information in a safe environment.

### **Rapport**

A concept related to the therapeutic alliance is *rapport*. Rapport can be described as the level of openness, relatedness, trust, empathy, warmth, interest, and effective communication between the client and therapist (Anderson & Anderson, 1962; Charny, 1966; Harrigan & Rosenthal, 1983; Kritzer, 1990). This is similar to Bordin's concept of *bond* between the therapist and client, independent of goals and tasks. The most widely used operationalization of rapport in everyday and therapeutic interactions was developed by Tickle-Degnen and Rosenthal (1990). They believed rapport consisted of three components: mutual attentiveness, coordination, and positivity. Mutual attentiveness reflects a genuine interest in another person, shared between two people. Coordination is

considered to be the harmony and synchronicity expressed throughout an interaction. Finally, positivity is the friendliness, care, and warmth expressed to each other, and this component is thought to have the largest contribution to rapport. Rapport often needs to be established quickly to create a warm, positive testing environment within minutes of meeting with a client, and research in single-session therapy has found this to be possible (Gibbons & Plath, 2009; 2012).

Rapport, as it pertains to the context of psychological testing, is typically established within a shorter period of time than the therapeutic alliance and is the client's first impressions of their relationship with the test administrator. Therefore, in the context of psychological testing, rapport may not include Tickle-Degnen and Rosenthal's coordination component of rapport, which is established during a longer interaction. By dismantling the construct of rapport into Tickle-Degnen and Rosenthal's (1990) three components and removing coordination, it is possible that positivity and mutual attentiveness, alone, could foster rapport in an online context.

The removal of coordination from Tickle-Degnen and Rosenthal's (1990) concept of rapport is the removal of synchronous interaction, which better accommodates the needs of clients. The remaining components of rapport—positivity and mutual attentiveness—retain the warmth, friendliness, and genuine interest that may build rapport online. The present study will use the term *asynchronous rapport* to represent the positivity and mutual attentiveness of a test administrator. One purpose of the present study is to assess whether asynchronous rapport can be established with a participant prior to testing.

**Establishing rapport.** The establishment of asynchronous rapport with the test administrator may reduce anxiety, elicit more self-disclosure, and may be important for gathering sensitive, valuable information from the client. State anxiety is the cognitive and behavioural signs of anxiety, such as feelings of nervousness and physical agitation, present in a particular moment, rather than a constant trait (Gaudy, Vagg, & Spielberger, 1975). When clients feel nervous, agitated, or uneasy they may have difficulty completing psychological tests due to overwhelming emotional distraction and reduced concentration. A study by Carless and Imber (2007) examined 460 job applicants' perception of the interviewer and state anxiety before and after being interviewed for a position. Applicants that perceived the interviewer to be warm, friendly, humorous, competent, and knowledgeable about the job reported significantly less state anxiety following the interview than prior to the interview. In accordance with these findings, a test administrator who displays characteristics associated with rapport (e.g., friendliness) may reduce a client's state anxiety immediately before psychological testing.

Rapport with the therapist also has been shown to facilitate self-disclosure of sensitive information in face-to-face interactions. For example, Farber, Berano, and Capobianco (2004) examined 21 clients' comfort with self-disclosing information to their therapist during a semi-structured interview. They found that most clients rated themselves on questionnaires as more comfortable with self-disclosing information when they perceived their therapist as understanding, nonjudgmental, and accepting. These characteristics may also be demonstrated by an online test administrator that seeks to establish asynchronous rapport with clients. In the context of psychological testing, it is possible that introducing an accepting, warm test administrator may foster a positive

environment and encourage the client to disclose more during testing. Therefore, being able to establish rapport online prior to testing may be critical for valid, thorough data collection.

Sattler and Ryan (2009) suggest that rapport can be established prior to test administration in numerous ways: (a) allaying anxiety by explaining what will happen, reassuring the client about confidentiality, and providing information about the test duration; (b) showing genuine interest, support, and warmth towards the client in a professional manner; and (c) helping the client feel at ease by engaging them in friendly conversation and test administrator self-disclosure. It is common for individuals to be apprehensive about psychological test administrators that are unfamiliar to them. The more informed clients are about the test procedures, the less they may fear the test administrator. Researchers have found that verbal behaviours, such as greetings, polite words, compliments, and lack of criticism, foster rapport with participants (Bronstein, Nelson, Livnat, & Ben-Ari, 2012). Rapport also can be enhanced with nonverbal behaviours such as smiling, head nodding, forward lean, and forward-facing body orientation (Tickle-Degnen & Rosenthal, 1990). Furthermore, it has been found that when therapists self-disclose personal information about themselves, they can elicit a higher quantity of self-disclosed information from the client (Bundza & Simonson, 1973; Joinson, 2001a). Bundza and Simonson (1973) measured participants' willingness to self-disclose personal information and participants' impressions of the therapist after the therapist self-disclosed information. Participants were given one of three versions of a transcript of a therapy session: (a) the therapist did not reveal any personal information, (b) the therapist did not reveal personal information but provided warm comments, or (c)

the therapist revealed personal information and provided warm comments. Using questionnaires, participants that read the transcript in which the therapist self-disclosed and made warm comments rated the therapist as more nurturing and rated themselves higher on willingness to self-disclose personal information to the therapist, compared to participants that read the other transcripts.

### **Online Therapeutic Alliance and Rapport**

**Online therapeutic alliance.** To better understand the basis of asynchronous rapport in an online environment, we can draw from the research on establishing a therapeutic alliance with online therapy clients. A study by Prado and Meyer (2006) examined the therapeutic alliance between clients and therapists partaking in online asynchronous therapy using a discussion forum for fifteen sessions. A measure of therapeutic alliance was administered every fifth session. They found that the therapeutic alliance scores obtained were similar to those found in prior research and concluded that a therapeutic alliance may be established between therapists and their clients in online asynchronous therapy.

Furthermore, many researchers have found similar ratings of therapeutic alliance strength in face-to-face compared to online therapy (Cook & Doyle, 2002; Day & Schneider, 2002; Reynolds, Stiles, & Grohol, 2006). For example, Cook and Doyle (2002) recruited fifteen clients who were beginning online counselling and examined their therapeutic alliance scores using Bordin's (1979) *Working Alliance Inventory* with their therapist after three sessions. Participants' therapeutic alliance scores were not significantly different from the twenty-five clients in face-to-face therapy that originally validated the measure (Horvath & Greenberg, 1989). Similarly, Day and Schneider

(2002) randomly assigned 80 clients to either face-to-face, real-time video conference, or real-time audio therapy conditions. Observers rated videos of the therapy sessions on a measure of therapeutic alliance consisting of patient characteristics (e.g., inhibited, frustrated, ashamed) and therapist characteristics (e.g., judgmental, optimistic, warmth, friendliness). Therapeutic alliance scores for the three therapy modalities did not differ significantly. These studies demonstrate the possibility that therapeutic alliances formed online can be just as strong as in person. However, it is currently unknown whether asynchronous rapport, as with therapeutic alliance, can be established online prior to Internet-based testing.

**Online rapport.** Asynchronous rapport is similar to Bordin's (1979) bond component of the therapeutic alliance in that it fosters positive relationships. Evidence for the effectiveness of asynchronous rapport comes from education research. Some distance education teachers strive to build online rapport with students, often using asynchronous online communication. A qualitative study by Murphy, Rodriguez-Manzanares, and Barbour (2012) examined rapport-building techniques that forty-two distance education secondary school teachers used to build a positive relationship with their students online. Semi-structured telephone interviews were used to collect information from the distance education teachers. Their results showed that distance education teachers strove to acknowledge the student as an individual, and were supportive, accessible, friendly, respectful, caring, and made a point of talking about topics besides academics. These characteristics are in accord with descriptors distance education students use to describe effective teachers (e.g., respectful, approachable, communicative, engaging, humorous; Delaney, Johnson, Johnson, & Treslan, 2010). Similarly, it may be possible that positive

rapport could also be established online between a test administrator and client. This may be accomplished by effectively communicating warmth and trust through the use of asynchronous communication, such as e-mails or online videos of the test administrator.

Many manuals of in-person psychological tests encourage test administrators to build rapport with the client prior to testing. However this suggestion has not become standard practice for the administration of online psychological tests. This is because the test administrator is often not available for real-time interaction while clients take online tests. Therefore, a potential critical shortfall of the transformation of paper-and-pencil tests to online formats may be the loss of establishing rapport and building a positive relationship with the client.

As psychologists begin to rely more on online testing, how test administrators present themselves to clients online needs to be investigated to determine if the test administrator's presentation affects client responses. It is unknown whether asynchronous rapport with a test administrator can be established online using the same methods of rapport building used prior to in-person testing and whether this will affect clients' responses differently than written instructions alone. It is also unknown whether asynchronous rapport with a test administrator facilitates greater client self-disclosure than the online disinhibition effect for individuals with and without social anxiety. Finally, it is unknown if online testing enables individuals with social anxiety to form a positive relationship with an online test administrator and if this relationship facilitates self-disclosure and eases anxiety during testing.

## **The Present Study**

Because only a small percentage of Canadian psychologists offer services in rural areas, there is a need to make psychological testing more accessible to Canadians living in rural areas and, in particular, students so that they can receive educational resources sooner if needed. One way of doing this is by researching the feasibility of online measures, such as measures for anxiety and self disclosure. In order to collect valid data for screening measures, students often need to self-disclose sensitive and potentially anxiety-provoking information online. Building asynchronous rapport with the test administrator may facilitate self-disclosure and reduce anxiety.

Using a 2 x 2 mixed design, the present study examined the effects of rapport format (asynchronous rapport vs no rapport) and test format (online vs pencil-paper) on self-disclosure, anxiety, test format preference, and perceived rapport with test administrator. For those in the asynchronous rapport condition, participants were presented with either an online video or an in-person presentation delivered by the test administrator in order to foster asynchronous rapport with the participant prior to test instructions. Participants in the no rapport condition did not view the online video or in-person presentation and only received the paper-and-pencil or on-screen test instructions.

## **Hypotheses**

**Hypothesis 1: The effect of the two main rapport conditions on perceived rapport.** Because participants in the rapport condition will receive a genuine, warm, friendly interaction with the test administrator, it is expected that they will report greater perceived rapport with the test administrator than those in the no rapport condition. This

is in accordance with Tickle-Degnen and Rosenthal's (1990) belief that positivity and mutual attentiveness contribute to rapport.

**Hypothesis 2: Consistency of test scores using different test formats and rapport.**

*Hypothesis 2a: Test score consistency on online and paper-and pencil formats.*

Scores from all of the paper-and pencil measures administered are expected to be correlated with their online format counterpart.

*Hypothesis 2b: The effect of rapport on test score consistency across different test formats.* It is hypothesized that the consistency of test scores between online and paper-and pencil formats of the same measures will differ depending on rapport condition. Participants in the no rapport condition may be more anxious and disclose less information in their responses on the paper-and-pencil measures but be influenced by the online disinhibition effect (i.e., increased self-disclosure, lower anxiety) when they take the same measures online. This discrepancy would result in inconsistent scores between the two formats.

In contrast, those in the asynchronous rapport condition may experience the online disinhibition effect during online testing but may also be influenced by the calming, self-disclosing test administrator prior to paper-and-pencil testing. The online disinhibition effect and rapport with a test administrator are similar in that they may both increase self-disclosure and reduce anxiety in participants. The similarity of the effects on participants may result in more consistent test scores between test formats.

**Hypothesis 3: Mediation between asynchronous rapport exposure and state anxiety.**

***Hypothesis 3a: Asynchronous rapport exposure and measure of state anxiety.*** In accordance with Sattler and Ryan (2009), rapport is established to help the client feel at ease. Participants in the asynchronous rapport condition are expected to feel more at ease and thus report lower levels of state anxiety than participants who are in the no rapport condition.

***Hypothesis 3b: Mediating effects of perceived rapport between asynchronous rapport exposure and measure of state anxiety.*** It is hypothesized that those in the asynchronous rapport condition would perceive rapport with the test administrator and this would lead to less anxiety during the testing than participants in the no rapport condition. If participants perceive rapport with the test administrator then it is expected that they will report lower state anxiety than participants who have negative perceptions of the test administrator.

**Hypothesis 4: Mediating effects between asynchronous rapport exposure and self-disclosure.**

***Hypothesis 4a: Asynchronous rapport exposure and self-disclosure.*** In therapy sessions, rapport has facilitated self-disclosure (Farber, Berano, & Capobianco, 2004; Leibert et al., 2006). Participants' level of self-disclosure may depend on if they experienced rapport with the test administrator. It is expected that participants who were exposed to asynchronous rapport with the test administrator will relay more personal information to the test administrator on measures of self-disclosure than those in the no rapport condition.

***Hypothesis 4b: Mediating effects of state anxiety between asynchronous rapport exposure and self-disclosure.*** It is hypothesized that those in the asynchronous rapport

condition would have less state anxiety resulting in greater self-disclosure than those in the no rapport condition. If the participant reports high state anxiety they may be more resistant to self-disclose. Reduced state anxiety from a positive relationship with the test administrator may facilitate self-disclosure.

***Hypothesis 4c: Mediating effects of perceived rapport between asynchronous rapport exposure and self-disclosure.*** It is hypothesized that those in the asynchronous rapport condition would perceive greater rapport with the test administrator resulting in greater self-disclosure than those in the no rapport condition. It is expected that clients who perceive stronger rapport with the test administrator will feel more comfortable self-disclosing personal information and will disclose more information than those who perceive low rapport with the test administrator.

**Hypothesis 5: Effects between test format and self-disclosure.**

***Hypothesis 5a: Test format and self-disclosure.*** In accordance with the online disinhibition effect, it is hypothesized that the amount of self-disclosure will be greater online than in-person (Suler, 2004).

***Hypothesis 5b: Relationship between social anxiety and self-disclosure on different test formats.*** Previous research suggests that individuals who are high in social anxiety may self-disclose more online than in person to their friends (Wang et al., 2011). Therefore it is hypothesized in the present study that participants with higher social anxiety would self-disclose more information online with a test administrator than those with lower social anxiety. It is also hypothesized that participants with higher social anxiety would self-disclose less information face-to-face with a test administrator in the paper-and-pencil condition than those with lower social anxiety.

**Hypothesis 6: Relationship between test format, Internet competency, social anxiety, and format preference.**

*Hypothesis 6a: Test format and format preference.* Because of the convenience of and prevalence of Internet use in today's students, it is expected that the majority of students will prefer the online test format over the paper-and-pencil format.

*Hypothesis 6b: Internet competency and format preference.* It is possible that Internet competency is related to participants' test preference. If participants are more comfortable and familiar with using computers and Internet applications then they may prefer online tests. Conversely, if participants are less familiar with online computer use, they may prefer in-person paper-and-pencil tests.

*Hypothesis 6c: Social anxiety and format preference.* Participants with high social anxiety may prefer online tests to paper-and-pencil tests, more so than participants with lower levels of social anxiety. Online testing does not involve any direct interaction with a test administrator and the test administrator is unable to see them during testing. These characteristics may be preferable testing conditions for participants with social anxiety.

## CHAPTER 3

### METHODOLOGY

#### **Participants**

A power analysis was conducted using a moderate effect size and suggested that approximately 144 participants would be needed. One hundred fifty-six undergraduate students (38 male, 127 female, 1 two-spirited) were recruited through the Psychology Department Participant Pool at a university in Southwestern Ontario. There were no exclusion criteria for participants because one of the benefits of online testing is that it may be accessed by anyone seeking assistance. Participants were given a bonus mark toward an eligible course upon completion of the study. The methodology for the present study was approved by the university's Research Ethics Board and participants were treated in accordance with the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans. Thirty of the 156 participants completed measures at time 1 but not time 2. The time 1 data were included in all analyses that did not compare time 1 data with time 2 data. One hundred forty participants completed the online measures and 134 participants completed the paper-and-pencil measures.

The 156 participants ranged in age from 18 to 53 years ( $M = 22.25$  years,  $SD = 5.66$  years). The majority of participants self-identified as White ( $n = 89$ , 57.1%), whereas the remainder self-identified as Aboriginal ( $n = 2$ ), Arab/West Asian ( $n = 18$ ), Asian ( $n = 13$ ), Black ( $n = 14$ ), Latin American ( $n = 4$ ), or "other" ( $n = 16$ ). Forty-eight participants were in their third year of study, in comparison to 41 in second year, 35 in first year, 22 in fourth year and 10 in their fifth year or beyond.

Participants reported their current psychological and physical disabilities. Twelve participants reported having one psychological disorder and eleven participants reported having multiple disorders. Of the participants that reported having one disorder, 3 had an anxiety disorder, 8 had a mood disorder, and 1 had ADHD. Of the participants that reported having multiple disorders, 11 had an anxiety disorder, 6 had a mood disorder, 2 had ADHD/Learning Disability, and 1 had a personality disorder. Eleven participants reported that they were receiving a form of pharmaceutical treatment for their psychological disorder, five of which were also receiving therapeutic services. Four participants were receiving therapeutic services alone. Eighteen participants reported having a physical disability. Of these students, 8 reported visual disabilities, 8 reported motor disabilities, 1 reported a hearing disability, and 1 reported epilepsy. The participant with a hearing disability reported having difficulties with the online video and was removed from the study. Four participants with psychological disabilities and six with physical disabilities reported that they were receiving services through the university's Student Disability Services.

The validity of participants' data was examined and removed if deemed invalid. Participants who stated on the debriefing questionnaire that their responses were "Mostly Untrue" ( $n = 5$ ) or "Completely Untrue" ( $n = 10$ ) were removed from the study. Additionally, the online data from participants in the asynchronous rapport conditions who stated they had technical problems with the online video were removed ( $n = 9$ ). The paper-and-pencil data for these participants were retained for analyses that did not require two time points of data. Two participants' online data were removed because they were accidentally given the link to the online survey of the wrong condition. One participant in

the no rapport condition was removed from analyses because the person was accidentally given the rapport script. Finally, six multivariate outliers were removed from the analyses because their data did not meet the assumptions of the statistical tests. The procedure for identifying outliers is discussed further in the Data Preparation section below.

With regard to their computer use, all participants reported having a computer with Internet access. All but one participant stated that their Internet connection was wireless and all but two participants had cell phones. One hundred and two participants reported having instant messaging. One hundred twenty-seven participants (95%) reported having a social networking account on the paper-and-pencil format and 131 participants (94%) reported having a social networking account on the online format. Percentages between formats varied due to different sample sizes as a result of attrition between time 1 and 2. How much time participants spend using different forms of technology was also examined on each format of the Comfort Level in Interacting with Others Measure (see Table 1).

Additionally on each format of this measure, participants reported how comfortable they feel communicating using different methods (e.g., text message, face-to-face; see Table 2). On all communication methods, participants' mean scores ranged from 3.72 to 4.14. The value "4" corresponds to the response "comfortable". This suggests that participants in this study were comfortable communicating face-to-face, on a cell phone, and using text messaging, social networking sites, and instant messaging. Participants also reported how often they get anxious when talking face-to-face with others. The most frequently endorsed response was "sometimes" participants get anxious

Table 1

*Frequency of Participants that Spend More than 30 Minutes per Day Partaking in Technological Activities*

Technological Activity	Format Type	
	Paper-and-Pencil (%)	Online (%)
Instant Messaging	41 (30.83)	51 (36.96)
Texting on Cell Phone	82 (61.65)	89 (63.57)
Talking on Cell Phone	37 (28.03)	38 (27.14)
Social Networks	104 (78.20)	107 (76.43)
Playing Video/Computer Games	21 (15.91)	39 (27.86)
E-mail	57 (42.86)	63 (45.00)
Online in general	122 (92.42)	134 (95.71)

Table 2

*Means and Standard Deviations for Comfort Communicating Using Different Methods*

Item	Paper-and-Pencil Format		Online Format	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Talking to others	4.05	.85	4.14	.80
Texting	4.10	.85	4.14	.91
Using a social network site	3.92	.89	3.99	.92
Instant messaging online	3.72	.91	3.85	.94
Talking on a cell phone	3.87	.91	3.91	.96

talking face-to-face [paper-and-pencil format ( $n = 66$ , 50%), online format ( $n = 65$ , 46%)]. Finally, participants in this study most frequently reported that they (a) frequently use text messaging to talk to someone instead of talking to them face-to-face [paper-and-pencil format ( $n = 61$ , 45.5%), online format ( $n = 54$ , 38.6%)], (b) sometimes use a computer to talk to someone instead of talking face-to-face [paper-and-pencil format ( $n = 52$ , 39.1%), online format ( $n = 62$ , 44.6%)], and (c) frequently use text messaging instead of calling and talking on their cell phone [paper-and-pencil format ( $n = 78$ , 58.2%), online format ( $n = 69$ , 49.3%)].

## Measures

Participants completed fourteen measures which assessed perceived rapport with test administrator, social anxiety, background information, self-disclosure, computer competency, trust in others, and communication and test format preferences. See Appendix A for a summary of these measures.

**Background information.** Participants completed a questionnaire that included ten items regarding their background characteristics such as age, gender, program of study, and ethnicity (see Appendix B). Participants reported present psychological disorders (e.g., anxiety disorders) and whether or not they had any physical limitations (e.g., visual, hearing, or motor impairment). Students who identified as having psychological disorders were asked about their use of medication, participation in therapy, and use of assistive technology. Finally, four items were created for the purpose of this study to examine how much participants trust different functions of the Internet (e.g., keep information confidential, send information). Participants' level of trust in the Internet to keep their information confidential and perform the duties they expect it to

perform may influence how much they choose to disclose online. Two items were rated on a 5-point Likert-type scale from 1 (*completely distrust*) to 5 (*completely trust*). One of these items assessed level of trust in the Internet to keep information confidential and the other item assessed level of trust in the Internet to relay information to the desired party. Another item examined the proportion of websites participants trusted. This item was rated on a 5-point Likert-type scale from 1 (*I don't trust any websites*) to 5 (*I trust all websites*). The final item was rated on a 5-point Likert-type scale from 1 (*not at all anonymous*) to 5 (*completely anonymous*). The four items had a Cronbach's alpha of .65 on the paper-and-pencil format and .60 on the online format.

**Rapport with test administrator.** Participants were asked to complete a new measure of rapport about the test administrator designed for the present study.

***Frost's Rapport Observations: Survey of Test administrators.*** The Frost's Rapport Observations: Survey of Test administrators (FROST) was used to examine the perceived rapport that participants felt with the test administrator (Appendix C). Because the FROST was a measure created for this study, its psychometric properties were also evaluated. The initial items on the measure were created using selected themes from a meta-analysis by Gremler and Gwinner (2000) that compared researchers' definitions of rapport: comfort, researcher competence, trust, likeability, acceptance, respect, understanding, connectedness, value, and sincerity. Items were also based on Anderson & Anderson's (1962) Rapport Rating Scale, which was used to assess rapport between a client and therapist after multiple sessions. The measure consists of 46 items that are rated on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Twenty-four items asked participants to rate how they felt about the test administrator (e.g., "I

feel comfortable with the test administrator”). The remaining twenty-two items asked participants how much they believed the test administrator has a characteristic (e.g., “The test administrator seems friendly”).

The psychometric properties of the FROST were examined prior to determining participants’ total scores on this measure. First, inter-item correlations were conducted using two-tailed Pearson correlations on both formats of the measure (paper-and-pencil and online). Separate correlation matrices were created and examined for each format of the test. On the paper-and-pencil format, each item was significantly correlated with 31 or more of the 46 items with three exceptions. The items “I feel I can’t respect the test administrator”, “I feel that I can’t relate with the test administrator”, and “I feel that I want the test administrator to like me” correlated with less than 25 other items. On the online format, each item was significantly correlated with 39 or more of the 46 items with one exception. The item “I feel that I want the test administrator to like me” correlated with only 10 other items.

Second, test items were examined for possible exclusion by assessing the FROST’s Cronbach’s alpha if the item was removed from the measure. For the paper-and-pencil format, the Cronbach’s alpha was found to improve from .954 to .955 when “I feel I can’t respect the test administrator”, “I feel that I can’t relate with the test administrator”, and “I feel that I want the test administrator to like me” were deleted from the measure. Similarly, for the online format, the Cronbach’s alpha improved from .965 to .967 when “I feel that I want the test administrator to like me” was deleted. Because of the discrepancy in problematic items, further analyses were done to determine which items would be eligible for exclusion.

Finally, exploratory factor analysis was conducted to examine the item loadings of the FROST. The FROST was designed to measure the single concept of asynchronous rapport with a test administrator. Therefore, it was anticipated that the items would be represented by one factor. However, due to the small sample size it was necessary to assess whether or not it was appropriate to factor analyze the data. The Kaiser-Meyer-Olkin statistic (KMO) was calculated and it indicated that the sampling adequacy was appropriate for the paper-and-pencil format (KMO = 0.89), as well as the online format (KMO = 0.91). Both of these values are well above the suggested cut-off of 0.6 (Tabachnick & Fidell, 2013). This suggested that the results of the factor analysis would yield reliable factors. In addition, the correlation matrices for both formats of the FROST (as mentioned above) revealed associations stronger than the recommended 0.3 (Tabachnick & Fidell, 2013). Because this was the first use of the FROST, separate factor analyses were conducted on each of its formats.

*PCA for paper-and-pencil FROST.* Principal components analysis (PCA) was conducted using the 46 items from the paper-and-pencil format of the FROST. Eigenvalues greater than one were first examined as recommended by Kaiser (1960). Eleven components met the criteria. However, as Table 3 shows, there was minimal increase in the percentage of variance explained beyond the first component. In accordance with Cattell (1966), the scree plot was also examined and indicated that only one factor should be retained.

To further assess whether a one-factor solution is appropriate, the stability of the measure's components also were examined. Despite the present study's relatively small sample size for factor analysis, it has been suggested by Guadagnoli and Velicer (1988)

Table 3

*Eigenvalues and Percentage of Variance Explained by Extracted Components from the Paper-and-Pencil Format of the FROST*

Component	Eigenvalue	Percent of Variance Explained
1	16.36	35.56
2	2.81	6.11
3	1.78	3.87
4	1.77	3.86
5	1.59	3.46
6	1.32	2.86
7	1.26	2.75
8	1.24	2.69
9	1.19	2.58
10	1.13	2.46
11	1.10	2.38

that the magnitude of component loadings (also known as component saturation) plays a larger role in determining stable components than sample size. They found that component loadings of .40 or less yielded less stable components and component loadings of .60 or greater yielded the most stable components regardless of sample size. The first component extracted on the FROST had 21 items with loadings above 0.6 (Table 4). The other components that were extracted did not have any loadings above 0.6. This provides further support that the FROST has only one component. The items with loadings less than .40 on this component were “I feel I can’t respect the test administrator”, “I feel that I can’t relate with the test administrator”, and “I feel that I want the test administrator to like me.”

*PCA for online FROST.* Principal components analysis (PCA) was next conducted using the 46 items from the online format of the FROST. Eight components had eigenvalues greater than one. Similar to the paper-and-pencil format, there was minimal increase in the percentage of variance explained beyond the first component (Table 5). The scree plot was also examined and indicated that only one factor should be retained.

Furthermore, the first component extracted on the online FROST had 28 items with loadings above 0.6 (see Table 6). As with the paper-and-pencil format, the other components that were extracted did not have any loadings above 0.6, providing further support that the online FROST has only one component. The item “I feel that I want the test administrator to like me” had component loading less than .40 and was much lower than the other items.

Table 4

*Factor Loadings and Communalities for the 46 items from the Paper-and-Pencil Format of the FROST*

Item	Factor Loadings	Communality
The test administrator seems accepting.	.789	.748
The test administrator seems trustworthy.	.780	.761
I feel comfortable with the test administrator.	.748	.673
The test administrator seems warm.	.734	.648
I feel accepted by the test administrator.	.729	.675
The test administrator seems friendly.	.727	.657
The test administrator seems sincere.	.710	.728
I feel respect towards the test administrator.	.703	.734
I feel that the test administrator does not have my best interests in mind.	.701	.720
The test administrator seems unfeeling.	.692	.749
I feel the test administrator and I wouldn't get along well.	.685	.608
The test administrator seems distant.	.669	.671
I feel uneasy with the test administrator.	.661	.757
The test administrator seems empathic.	.660	.715
I feel the test administrator has my best interests in mind.	.653	.683
I feel I can trust the test administrator.	.650	.722
I feel skeptical of the test administrator's abilities.	.642	.645.
The test administrator seems courteous.	.639	.706
The test administrator seems judgemental.	.623	.765
The test administrator seems calm.	.615	.739
I feel confident in the test administrator's abilities.	.607	.613
The test administrator seems interested in me.	.605	.633
I feel valuable to the test administrator.	.600	.685
I feel comfortable disclosing sensitive information to the test administrator.	.588	.767
The test administrator seems dependable.	.587	.538
The test administrator seems dishonest.	.586	.646
The test administrator seems uninterested in me.	.583	.562
The test administrator seems unprofessional.	.580	.679
I feel the test administrator trusts me.	.579	.689
The test administrator seems professional.	.559	.708
I feel that the test administrator understands me.	.554	.607
I feel I can be myself with the test administrator.	.547	.599
I feel uncomfortable risking sensitive	.528	.747

information with the test administrator.		
The test administrator seems intimidating.	.514	.755
The test administrator seems naïve.	.511	.733
The test administrator seems impersonal.	.505	.638
The test administrator seems disrespectful.	.500	.707
I feel like I will be punished if I say the “wrong” thing.	.492	.641
I feel inferior to the test administrator.	.477	.625
I feel I have to hide my “true” self from the test administrator.	.454	.724
The test administrator seems superficial.	.423	.612
I feel that my responses will be misunderstood by the test administrator.	.413	.752
I feel connected with the researcher.	.406	.695
I feel that I want the test administrator to like me.	.288	.712
I feel that I can’t relate with the test administrator.	.284	.742
I feel I can’t respect the test administrator.	.236	.631

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Table 5

*Eigenvalues and Percentage of Variance Explained by Components Extracted from the Online Format of the FROST.*

Component	Eigenvalue	Percent of Variance Explained
1	18.88	41.04
2	3.62	7.87
3	1.86	4.04
4	1.81	3.94
5	1.59	3.45
6	1.36	2.96
7	1.18	2.57
8	1.08	2.35

Table 6

*Factor Loadings and Communalities for the 46 items from the Online Format of the*

*FROST*

Item	Factor Loadings	Communality
The test administrator seems sincere.	.792	.763
I feel uneasy with the test administrator.	.785	.726
The test administrator seems dishonest.	.773	.785
The test administrator seems judgemental.	.768	.744
The test administrator seems unfeeling.	.761	.777
The test administrator seems friendly.	.746	.772
The test administrator seems intimidating.	.736	.700
I feel confident in the test administrator's abilities.	.733	.697
The test administrator seems accepting.	.730	.726
The test administrator seems distant.	.727	.728
The test administrator seems unprofessional.	.722	.752
The test administrator seems warm.	.708	.708
The test administrator seems professional.	.703	.686
The test administrator seems uninterested in me.	.703	.721
I feel I have to hide my "true" self from the test administrator.	.700	.740
I feel respect towards the test administrator.	.687	.688
I feel that the test administrator does not have my best interests in mind.	.673	.637
The test administrator seems empathic.	.672	.638
I feel comfortable with the test administrator.	.669	.672
The test administrator seems impersonal.	.656	.681
The test administrator seems disrespectful.	.650	.790
The test administrator seems trustworthy.	.638	.558
I feel accepted by the test administrator.	.632	.728
The test administrator seems superficial.	.631	.630
The test administrator seems naïve.	.626	.585
I feel inferior to the test administrator.	.624	.608
I feel skeptical of the test administrator's abilities.	.620	.537
I feel like I will be punished if I say the "wrong" thing.	.612	.704
I feel I can trust the test administrator.	.599	.705
I feel that my responses will be misunderstood by the test administrator.	.594	.579
I feel the test administrator has my best interests in mind.	.593	.637

The test administrator seems calm.	.590	.669
I feel I can be myself with the test administrator.	.578	.636
The test administrator seems courteous.	.576	.666
I feel the test administrator and I wouldn't get along well.	.571	.665
I feel I can't respect the test administrator.	.561	.605
I feel uncomfortable risking sensitive information with the test administrator.	.555	.715
I feel comfortable disclosing sensitive information to the test administrator.	.552	.781
I feel valuable to the test administrator.	.550	.667
The test administrator seems dependable.	.544	.582
The test administrator seems interested in me.	.541	.704
I feel that the test administrator understands me.	.531	.727
I feel that I can't relate with the test administrator.	.528	.581
I feel the test administrator trusts me.	.501	.737
I feel connected with the researcher.	.444	.521
I feel that I want the test administrator to like me	.140	.673

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In summary, evidence from the correlation matrices, component loadings, and evaluation of the Cronbach's alphas suggested that three items from the FROST were problematic. A conservative approach was taken whereby the three problematic items ("I feel I can't respect the test administrator," "I feel that I can't relate with the test administrator," and "I feel that I want the test administrator to like me") were removed from the FROST measure. Total scores for each format of the FROST were computed by summing the scores of the 43 items that were retained. Higher scores represented stronger perceived rapport with the test administrator.

**Trust.** Participants were asked to complete multiple items about how much they trust others in general and specific groups of people.

***Trust in People.*** Trust in People (TIP) is a scale from the General Social Survey (Statistics Canada, 2013b). It is used to measure interpersonal trust with different groups of people (e.g., family, strangers). Items are answered on a Likert-type scale, ranging from 1 (*cannot be trusted at all*) to 5 (*can be trusted a lot*). The TIP was used to determine whether or not some participants were predisposed to distrust strangers, and potentially the test administrator. In the present study, the Cronbach's alpha was .72 for the paper-and-pencil format and .65 for the online format.

***People Can Trust Question.*** The People Can Trust question (PCT) is a single item from the General Social Survey (Statistics Canada, 2013c). It is used to measure the trustworthiness, or lack thereof, that individuals believe the general public to possess. The item is: "Generally speaking, would you say that most people can be trusted or that you cannot be too careful in dealing with people?" This item can be answered with either a 1 (*most people can be trusted*) or 2 (*you cannot be too careful in dealing with people*).

In 2003, 44% of Canadians answered that *you cannot be too careful in dealing with people* on the General Social Survey (Statistics Canada, 2004). Therefore the PCT will be used to determine whether or not some participants are predisposed to distrust strangers, and potentially the test administrator.

**Anxiety.** Participants were asked to complete two measures of anxiety: one to assess general social anxiety and one to assess state anxiety (symptoms of anxiety they may be experiencing during the study).

***Social Interaction Anxiety Scale-Short Form.*** The *Social Interaction Anxiety Scale-Short Form* (SIAS-SF) measures how socially anxious participants are in general interactions with others (Peters, Sunderland, Andrews, Rapee, & Mattick, 2012). It is a 6-item self-report measure that uses a 5-point Likert-type scale, ranging from 0 (*not characteristic or true of me*) to 4 (*extremely true of me*), to answer items such as, “I have difficulty talking with other people.” The total score is the sum of the item scores. High scores represent greater social anxiety, and scores of 7 or more are characteristic of individuals with social phobia (sensitivity = 84.86; 95% CI = 81.2–88.0; specificity = 97.67; 95% CI = 93.4–99.5). Peters and colleagues (2012) found that test-retest reliability had Cronbach alpha coefficients ranging from .88 to .92 and convergent validity with the original SIAS was  $r = .88$ . In the present study, the Cronbach’s alpha was .84 for the paper-and-pencil format and .77 for the online format.

***STICSA State Scale.*** The State Trait Inventory for Cognitive and Somatic Anxiety—State Scale (STICSA State Scale) is a 21-item self-report scale that measures the amount and severity of anxiety symptoms individuals are experiencing at the time of testing (Ree, French, MacLeod, & Locke, 2008). The STICSA State Scale consists of two

factors: cognitive and somatic. The cognitive factor is comprised of 10 items that assess cognitive symptoms of anxiety such as, “I can’t get some thought out of my mind”. The somatic factor is comprised of 11 items that assess somatic symptoms of anxiety such as, “My heart beats fast.” Items are scored on a 4-point Likert-type scale, ranging from 1 (*not at all*) to 4 (*very much*). Higher scores represent greater anxiety experienced in the moment. The cognitive factor has a split-half reliability of .90, whereas the somatic factor has a split-half reliability of .88. The correlation between the factors was found to be  $r = .73$ . Scores from both factors are summed to generate a total score. The total STICSA State Scale has high internal reliability with a Cronbach’s alpha of .92 (Grös, Simms, & Antony, 2010). In the present study, the Cronbach’s alpha was .91 for the paper-and-pencil format and .92 for the online format. In previous studies, the STICSA State Scale has demonstrated good convergent validity with the State-Trait Anxiety Inventory and the Depression Anxiety Stress Scales with correlations of .65 and .67, respectively (Grös et al., 2010). The STICSA State Scale was used to represent state anxiety as a mediator and dependent variable.

**Self-disclosure.** Participants completed two self-report and one behavioural measure of self-disclosure. These measures examined self-disclosure using different communication modalities, to whom one self-discloses, and whether one chooses to self-disclose personal information or not. These measures were examined individually as dependent variables.

***Perceived Breadth & Depth of Online Communication.*** This measure is a 9-item self-report measure that examines the qualities of online versus face-to-face self-disclosure (Valkenburg & Peter, 2007). It has two subscales: breadth and depth of

communication. Breadth consists of four items that measure the variety of topics that individuals feel comfortable discussing (e.g., “On the Internet I talk about different topics more easily than during a face-to-face encounter”). Depth consists of five items that measure how comfortable participants feel disclosing intimate information (e.g., “On the Internet, I talk more easily about my secrets than in a face-to-face encounter”). Items were answered using a 5-point Likert-type scale from 1 (*disagree entirely*) to 5 (*agree entirely*). Higher scores represent more disclosure online and lower scores represent more disclosure face-to-face. In the present study, the breadth subscale had a Cronbach’s alpha of .76 on the paper-and-pencil format and .82 on the online format. Additionally, the depth subscale had a Cronbach’s alpha of .90 on the paper-and-pencil format and .93 on the online format.

***Self-Disclosure Index (SDI)***. The SDI measures the degree to which participants would self-disclose uncommonly known personal details with a stranger (Miller, Berg, & Archer, 1983). For example, participants rated how much they would discuss the following item with another person: “My personal habits.” The measure was adapted so that the person with whom the topic is discussed was changed from “stranger” to “test administrator.” It is a 10-item self-report measure that uses a 5-point Likert-type scale that ranges from 0 (*discuss not at all*) to 4 (*discuss fully and completely*). Higher scores represent greater comfort self-disclosing to a test administrator. Lower scores are characteristic of those resistant to self-disclosing personal information to a test administrator. The original SDI’s internal consistency has been found to have a Cronbach’s alpha of .93. Convergent validity with the Jourard Self Disclosure

Questionnaire was  $r = .66$  to  $.74$ . In the present study, the Cronbach's alpha was  $.93$  on both the paper-and-pencil and online formats.

**Disclosure Probes.** A twenty-four item behavioural measure used by Kaplan, Firestone, Degnore, and Moore (1974) addressed participants' tendencies to self-disclose information. They were asked a series of items (12 intimate, 12 non-intimate) and their self-disclosure rate was determined by whether or not they provided a response by typing/writing an answer or selecting the "I prefer not to answer" option. More intimate items include: "How old were you the first time you had relations?" and "Would you describe any things that you dislike about your mother?" A non-intimate item is: "How much do you enjoy watching athletic events?" The intimacy of the items were determined through Thurstone-scaled intimacy values, such that non-intimate items had scores ranging from 1.8 to 3.0 out of 11 and intimate items had scores ranging from 8.1 to 10.7 out of 11, in which higher values represent more intimate items. Self-disclosure on this measure was determined by the frequency of typed/written responses to the questions; the greater the frequency of typed/written responses to sensitive items, the greater their self-disclosure. In the present study, the Cronbach's alpha was  $.81$  on the paper-and-pencil format and  $.85$  on the online format.

**Computer competency.** The Internet Self-Efficacy scale (Chung, Park, Wang, Fulk, & McLaughlin, 2010) is a 10-item self-report measure used to assess how confident students are in their ability to use the Internet. Participants respond to items such as, "I feel confident sending e-mail messages," and "I feel confident finding information by using a search engine," on a 5-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Higher scores represent greater competency in Internet use. The Internet

Self Efficacy scale has high internal consistency with a Cronbach's alpha of .85. It has demonstrated strong convergent validity with significant correlations with measures of perceived technology affordances, perceived ease of use and usefulness of online communities, and behavioural intention to participate in online communities (Chung et al., 2010). In the present study, the Cronbach's alpha was .85 on the paper-and-pencil format and .87 on the online format.

**Communication preferences.** Pierce's (2009) Comfort Level in Interacting with Others Measure measures how often and how comfortable one feels communicating in the following ways: online, face-to-face, text messaging, online instant messaging, and by telephone. It is a 23-item self-report questionnaire with two parts. The first twelve items provided demographic information and information on the duration of interaction with others using different communication methods (e.g., instant messaging). Two of these items were removed for the present study because they were included in the background information. Six of the final eleven items assessed the frequency of use of different communication methods (e.g., "How often do you text message someone instead of talking to them in person") using a 5-point Likert-type scale, ranging from 1 (*always*) to 5 (*never*). The remaining five items assessed level of comfort using different communication methods ("How comfortable are you talking with others using text messaging") on a Likert scale from 1 (*very comfortable*) to 5 (*very uncomfortable*). Internal consistency reliability showed a Cronbach's alpha coefficient of .79. A total score for these final eleven items was not computed but the items provided valuable descriptive information. The authors reported a Cronbach's alpha coefficient of .79. In

the present study, a Cronbach's alpha of .59 was found for these eleven items on the paper-and-pencil format and .67 on the online format.

**Social desirability.** The Social Desirability Scale-17 (SDS-17; Stöber, 2001) is a 16-item self-report questionnaire that was used to measure if participants respond in socially favourable ways. Social desirability may influence how much intimate information participants choose to self-disclose. Participants select *true* or *false* in response to items, such as, "I always eat a healthy diet," and, "In traffic I am always polite and considerate of others". High scores on the SDS-17 suggest that a participant is responding in a manner that would make them appear more favourable. The SDS-17 has demonstrated good internal consistency, with a Cronbach's alpha of .78, and adequate convergent validity with a correlation with the Marlowe-Crowne Social Desirability Scale ( $r = 0.51$ ), for subjects, age 18-29. Furthermore, the SDS-17 has demonstrated convergent validity with adequate correlations with other measures of social desirability such as the Eysenck Personality Questionnaire Lie Scale ( $r = 0.60$ ) and Sets of Four ( $r = 0.52$ ). The SDS-17 also has strong discriminant validity, represented by nonsignificant correlations with the NEO Five Factor Inventory scales of Neuroticism, Extraversion, and Openness to Experience. In the present study, a Cronbach's alpha of .78 was found on the paper-and-pencil format and .79 on the online format.

## **Materials**

**Asynchronous rapport.** An asynchronous rapport building script was developed for the study and was performed by the test administrator (the author) for the participants (Appendix D). In accordance with prior research on rapport (Bronstein et al., 2012; Ehrlich & Graeven, 1971; Sattler & Ryan, 2009; Sprecher, Treger, Wondra, Hilaire, &

Wallpe, 2013), the script directed the test administrator to welcome the participant, introduce herself with self-disclosure about family, and then provide instructions for the test. While performing the script, the test administrator used verbal (warm, expressive vocal quality) and nonverbal behaviours (smiling, direct body orientation) that facilitated rapport in ways consistent with previous research (Tickle-Dugen & Rosenthal, 1990). Nonverbal actions were scripted for consistency. The script was performed at a pace that matched the duration of the online video as close as possible.

The asynchronous rapport online video was performed by the same test administrator as the one performing the in-person asynchronous rapport presentation and used the same script. During filming, the test administrator's verbal and nonverbal actions were as similar as possible to the in-person asynchronous rapport condition. The online video was 67 seconds long. Participants were instructed to watch the video immediately before completing the measures.

### **Design and Procedure**

Participants were randomly assigned to one of four experimental groups (see Table 7). Two of the conditions did not contain the script/video that was designed to build rapport with the participants (no rapport condition). Once signed up through the participant pool website, participants in the “no rapport” condition receiving the online test format at Time 1 were provided with an Internet link to the study website and logged on to complete the measures at home. A consent form (see Appendix E) and the written instructions (see Appendix F) were presented online prior to the measures without building rapport with participants.

Table 7

*Research Design*

Rapport Condition	<i>n</i>	Time 1	Time 2
No Rapport			
Group 1	38	Online	Paper-and-Pencil
Group 2	36	Paper-and-Pencil	Online
Rapport			
Group 3	40	Online	Paper-and-Pencil
Group 4	42	Paper-and-Pencil	Online

Participants in the “no rapport” condition receiving the paper-and-pencil test format at Time 1 came into a lab on campus. The test administrator only provided the consent form and the necessary written instructions, but did not use gestures, had a neutral facial expression, and did not self-disclose personal information about herself or her family.

The two “asynchronous rapport” conditions were designed to establish asynchronous rapport with the participants. Participants in the “asynchronous rapport” condition receiving the online test format at Time 1 were provided with an Internet link to the study website and logged on and completed the study at home. A consent form, asynchronous rapport video, and the measure instructions were presented online prior to the measures. Participants were unable to begin the measures unless they checked a box stating that they watched the entire asynchronous rapport video.

Participants in the “asynchronous rapport” condition receiving the paper-and-pencil test format at Time 1 came into a lab on campus. They were welcomed by the test administrator in person and listened to the asynchronous rapport script and instructions prior to completing the measures.

The order that tests were completed in every condition was: FROST, STICSA State Scale, Disclosure Probes, SDI, PCT, SDS-17, SIAS-SF, Perceived Breadth and Depth of Online Communication, Comfort Level Interacting with Others Measure, Internet Self-Efficacy, and background information. The FROST, STICSA State Scale, Disclosure Probes, and SDI were administered first so that participants could readily recall their encounter with the test administrator and how that encounter made them feel (e.g., comfortable, anxious, willing to self-disclose information). The remaining

questionnaires did not directly measure the effects of the asynchronous rapport condition, so they were completed after the first measures.

One week later, participants completed the measures in the format not previously received (Time 2). For example, participants in the “no rapport” group that completed the online test format at home at Time 1 came into the lab and completed the paper-and-pencil format at Time 2. Participants who viewed the asynchronous rapport video and completed the online test format at home at Time 1 came into the lab, listened to the asynchronous rapport script in person, and completed the paper-and-pencil format at Time 2. The opposite procedure occurred for those who completed the paper-and-pencil format first.

Once the Time 2 measures were completed, both groups were asked which test format they preferred after experiencing both formats. In addition, participants completed a series of debriefing items, based on their condition, regarding their impressions of the test administrator, rapport building script, and online video (Appendix G and H).

## CHAPTER IV

### RESULTS

The results were divided into three main sections: Data Preparation, Main Hypotheses, and Supplementary Analyses. The Data Preparation section contains information about how missing data were handled and how preliminary data were analysed (e.g., testing order effects, assumptions). The Main Hypotheses section examines the statistical results for each of the six hypotheses. The Supplementary Analyses section provides additional information on participants' trust in the Internet and feedback about the test formats and introduction with the test administrator.

#### **Data Preparation**

**Missing Data.** Missing data were analyzed using the SPSS Missing Value Analysis (MVA), which indicated that no variable was missing more than 5% of data and that all scales were missing completely at random with the exception of the paper-and-pencil format of the FROST (Little's MCAR  $\chi^2(756, N = 140) = 295.41, p = 0.001$ ). Because multiple imputation does not assume that variables have completely random missing values (Tabachnick & Fidell, 2013), it was used to calculate missing values.

**Preliminary analyses.** Preliminary analyses were conducted to detect potential outliers and violations of assumptions prior to data analyses. First, data on both formats of every measure were examined for outliers using boxplots in accordance with the assumptions for correlations, *t*-tests, two-factor ANOVAs, and linear regression. Twenty-nine total scale scores from multiple measures were identified as outliers using boxplots. Of these 29 participant scores, 14 were found to be outliers using Mahalanobis distance ( $p < .001$ ) and five were found to be outliers influencing linearity (using Standardized

Residuals  $> |2.5|$ ). The data points identified as multivariate outliers belonged to six participants which were removed from all analyses. Of the multivariate outliers removed, four were in the rapport condition and two were in the no rapport condition.

Second, the remaining assumptions for correlations,  $t$ -tests, one-way ANOVAs, repeated measures ANOVAs, and linear regression (e.g., normality, homogeneity of variance, linearity, homoscedasticity, multicollinearity) were tested. In order to test normality, skewness and kurtosis were examined for each variable. Skewness values greater than  $|2|$  and kurtosis values greater than  $|3|$  were considered problematic; however, no variables exceeded these cutoffs. Descriptive statistics for all variables are provided below (Table 8).

Levene's test of equal variances was used to test the assumption of homogeneity of variance for  $t$ -tests, one-way ANOVAs, and repeated measures ANOVAs. Measures that violated this assumption included the paper-and-pencil Disclosure Probes, as well as the online formats of the Self-Disclosure Index (SDI) and Social Interaction Anxiety Scale-Short Form (SIAS-SF). In order to compensate for these violations, corrected degrees of freedom were used for the calculation of  $t$ -tests, Welch's test was used in place of one-way ANOVAs, Dunnett's T was used for post-hoc analyses, and the Greenhouse-Geisser correction was used for repeated measures ANOVAs. Curve estimation tests and inspection of scatterplots were used to test for linearity between variables for linear regression analyses. Linear relationships were determined to be the best fit for the data (in comparison to quadratic, cubic, logarithmic relationships). Distributions of the residuals were examined to test for homoscedasticity and some violations were found. The online SDI appeared to have heteroscedastic residuals when examined for hypothesis

Table 8

*Descriptive Statistics for All Measures and Formats*

Measure ( <i>n</i> )	<i>M</i>	<i>SD</i>	Participant Scores		Range of Possible Scores
			Lowest	Highest	
Paper-and-Pencil (134)					
FROST	177.49	20.76	130	215	43-215
DP	21.15	2.92	11	24	0-24
STICSA State Scale	33.30	10.07	21	68	21-84
SDI	26.88	8.86	0	40	0-40
PBD	21.40	8.05	9	41	9-45
SIAS-SF	6.91	5.26	0	22	0-24
PCT	1.50	0.50	1	2	1-2
TIP	14.98	3.19	7	22	5-25
ISE	40.46	6.43	24	50	10-50
SDS-17	7.41	3.66	0	16	0-16
Online (140)					
FROST	165.48	23.03	105	215	43-215
DP	20.80	3.45	8	24	0-24
STICSA State Scale	33.63	10.77	21	64	21-84
SDI	19.79	7.72	0	30	0-40
PBD	22.79	8.82	9	44	9-45
SIAS-SF	5.50	4.04	0	16	0-24
PCT	1.51	0.50	1	2	1-2
TIP	15.33	3.01	7	24	5-25
ISE	40.64	7.19	11	50	10-50
SDS-17	7.55	3.71	0	16	0-16

*Note.* FROST = Frost's Rapport Observations: Survey of Test administrators; DP = Disclosure Probes; SDI = Self-Disclosure Index; STICSA State Scale = State-Trait Inventory for Cognitive and Somatic Anxiety: State Scale; PBD = Perceived Breadth & Depth of Online Communication; SIAS-SF = Social Interaction Anxiety Scale Short Form; PCT = People Can Trust; TIP = Trust in People; ISE = Internet Self-Efficacy scale; SDS-17 = Social Desirability Scale 17.

4b. To correct for this violation, a logarithmic transformation was applied. In addition, a square root transformation was applied to the online Disclosure Probes to correct for heteroscedastic residuals on hypothesis 5b. For interpretive purposes, the transformed data are reported for analyses but the non-transformed data are reported for descriptive statistics (e.g., means). No issues of multicollinearity were found when variance inflation factors (VIF) and tolerance values were examined.

Third, test order effects were examined for the four groups using an ANOVA and post hoc tests. Some participants received the online questionnaires first ( $n = 78$ ) while others received the paper-and-pencil questionnaires first ( $n = 78$ ). Post hoc tests (i.e., Dunnett's T) showed no significant differences between the two rapport conditions (rapport-online at time 1 and rapport-online at time 2) or the two no rapport conditions (no rapport-online at time 1 and no rapport-online at time 2) on both formats of all measures, with one exception. The responses on the online format of the Internet Self Efficacy Scale (ISE) were significantly different for the two no rapport conditions depending on the order in which they received the online format ( $p = .04$ ). The online ISE was the only measure that found an order effect between groups in the same condition. Therefore, it was deemed appropriate to collapse the four groups into two (rapport and no rapport groups) for the analysis of all of the hypotheses with the exception of hypothesis 6b which used the online ISE. For this hypothesis, participants that received the online ISE at time 1 were analyzed separately from those who received it at time 2.

Finally, potential covariates were examined using a correlation matrix (Table 9 and 10). Social desirability was strongly correlated to measures of self-disclosure (both formats of the Disclosure Probes and Self-Disclosure Index) and the paper-and-pencil

Table 9

*Correlation Matrix for Paper-and-Pencil Variables*

Measures	1	2	3	4	5	6	7	8	9	10
1. FROST		.11	-.05	.39**	-.19	-.28**	-.05	.27**	.26**	-.06
2. DP			-.03	.59**	.01	-.17*	-.16	.04	.34**	-.31**
3. STICSA				.04	.17	.44**	.20*	-.21*	-.10	.07
4. SDI					-.07	-.18*	-.14	.21*	.34**	-.32**
5. PBD						.38**	.05	-.15	.03	-.17
6. SIAS							-.07	-.10	-.25**	-.05
7. PCT								-.43**	.06	.06
8. TIP									.00	-.02
9. ISE										-.21*
10. SDS-17										

*Note.* FROST = Frost's Rapport Observations: Survey of Test administrators; DP = Disclosure Probes; STICSA State Scale = State-Trait Inventory for Cognitive and Somatic Anxiety: State Scale; SDI = Self-Disclosure Index; PBD = Perceived Breadth & Depth of Online Communication; SIAS-SF = Social Interaction Anxiety Scale Short Form; PCT = People Can Trust; TIP = Trust in People; ISE = Internet Self-Efficacy; SDS-17 = Social Desirability Scale 17.  
\* $p < .05$ , \*\* $p < .001$ .

Table 10

*Correlation Matrix for Online Variables*

Measures	1	2	3	4	5	6	7	8	9	10
1. FROST		.12	-.17*	.22**	-.28**	-.27**	-.12	.13	.12	-.01
2. DP			-.06	.58**	.02	-.09	-.14	-.03	.16	-.18*
3. STICSA				-.02	.18*	.48**	.30**	-.13	-.04	-.14
4. SDI					-.07	-.12	-.13	.19*	.21*	-.33**
5. PBD						.36**	.07	-.00	.01	-.13
6. SIAS							.09	-.09	-.21*	-.14
7. PCT								-.55**	-.08	-.03
8. TIP									-.02	.07
9. ISE										-.16
10. SDS-17										

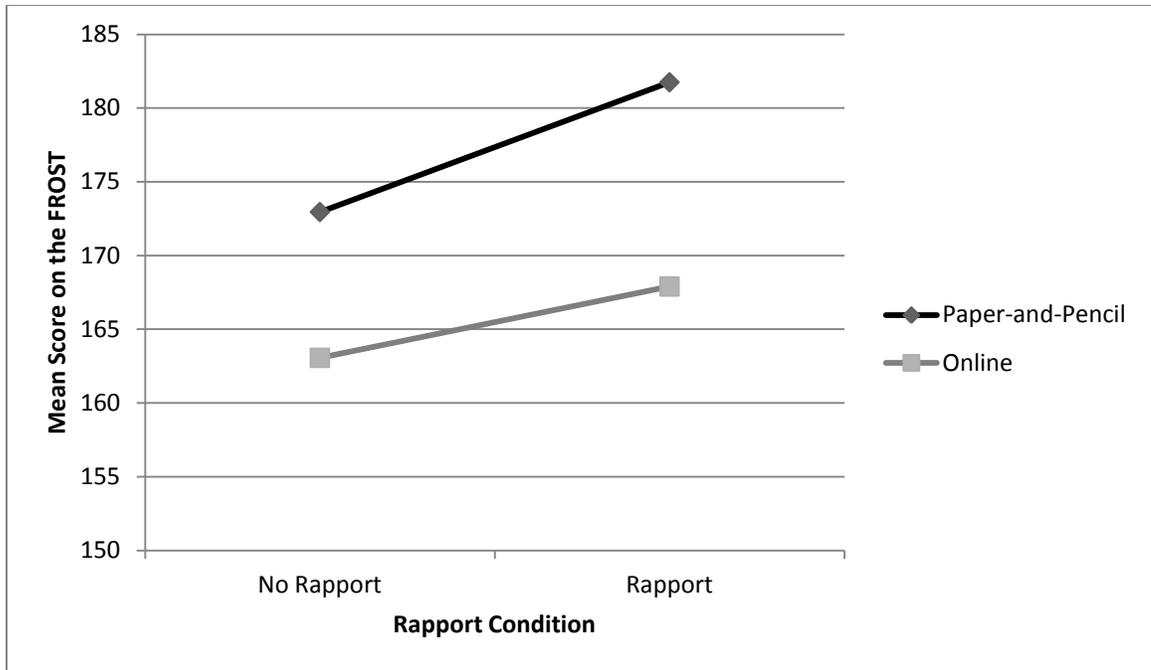
*Note.* FROST = Frost's Rapport Observations: Survey of Test administrators; DP = Disclosure Probes; STICSA State Scale = State-Trait Inventory for Cognitive and Somatic Anxiety: State Scale; SDI = Self-Disclosure Index; PBD = Perceived Breadth & Depth of Online Communication; SIAS-SF = Social Interaction Anxiety Scale Short Form; PCT = People Can Trust; TIP = Trust in People; ISE = Internet Self-Efficacy; SDS-17 = Social Desirability Scale 17.  
\* $p < .05$ , \*\* $p < .001$ .

format of the Internet Self-Efficacy scale. Because participants completed online and paper-and-pencil measures of social desirability, the average score of the two formats was used as the covariate. Therefore the average social desirability score was used as a covariate in analyses that included the variables with which it covaried.

### **Main Hypotheses**

**Hypothesis 1.** Simple linear regression was used to examine whether perceived rapport (measured by the FROST) was predicted by participants' rapport condition (see Figure 1). Rapport condition significantly predicted perceived rapport on the paper-and-pencil FROST,  $\beta = .21$ ,  $t(132) = 2.50$ ,  $p = .014$ , such that being assigned to a rapport condition predicted greater perceived rapport. Rapport condition also explained a significant proportion of the variance in perceived rapport scores,  $F(1, 132) = 6.25$ ,  $p = .014$ ,  $R^2 = .05$ . In contrast, rapport condition did not significantly predict perceived rapport on the online FROST,  $\beta = .11$ ,  $t(138) = 1.25$ ,  $p = .215$ ,  $R^2 = .01$ .

**Hypothesis 2a.** Correlations, ANOVAs, and ANCOVAs were used to examine the degree of similarity of test scores from the online and paper-and-pencil formats of the measures used (i.e., FROST, Disclosure Probes, STICSA State Scale, SDI, Perceived Breadth and Depth of Online Communication, SIAS-SF, PCT, TIP, and ISE). All correlations were statistically significant at  $p < .001$  (see Table 11), suggesting consistency between formats. However, when ANOVAs were conducted, the FROST and SIAS-SF had significantly higher scores on the paper-and-pencil format than the online format, and the Perceived Breadth and Depth of Online Communication, showed significantly higher scores on the online format compared to the paper-and-pencil format (see Table 11).



*Figure 1.* Perceived rapport with test administrator as a function of test format and rapport condition.

Table 11

*Comparison Between Test Formats (Online and Paper-and-Pencil) Measured by*

*Correlations and Repeated Measures ANOVAs/ANCOVAs*

Measure	<i>r</i>	<u>Paper-and-Pencil</u>		<u>Online</u>		<i>F</i>
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
FROST	.71**	177.49	20.76	165.48	23.03	72.73**
DP	.77**	21.26	2.80	20.68	3.60	1.39 <sup>a</sup>
STICSA State Scale	.72**	33.30	10.07	33.63	10.77	0.20
SDI	.76**	27.08	8.81	19.53	7.70	0.01 <sup>a</sup>
PBD	.77**	21.40	8.05	22.79	8.82	6.21*
SIAS-SF	.65**	6.91	5.26	5.50	4.05	16.62**
PCT	.76**	1.50	0.50	1.51	0.50	1.14
TIP	.78**	14.98	3.19	15.33	3.01	1.24
ISE	.47**	40.64	6.40	40.08	7.35	0.76 <sup>a</sup>

*Note.* FROST = Frost's Rapport Observations: Survey of Test administrators; DP = Disclosure Probes; STICSA State Scale = State-Trait Inventory for Cognitive and Somatic Anxiety: State Scale; SDI = Self-Disclosure Index; PBD = Perceived Breadth & Depth of Online Communication; SIAS-SF = Social Interaction Anxiety Scale Short Form; PCT = People Can Trust; TIP = Trust in People; ISE = Internet Self-Efficacy.

<sup>a</sup> Variables that included social desirability as a covariate.

\* $p < .05$ , \*\* $p < .001$ .

**Hypotheses 2b.** Given that some of the measures showed format differences, further analyses were conducted using two-factor repeated measures ANOVAs (test format as the within-subject factor and rapport condition as the between-subject factor) to assess the consistency of participants' scores on all measures across formats based on their rapport condition. Significant interactions would indicate inconsistent responses on different formats based on their rapport condition. Two interactions were found. Using the Greenhouse-Geisser correction, scores on the two formats of the SDI, which measured self-disclosure, varied depending on their rapport condition,  $F(1, 115) = 3.98, p = .048$ . Specifically, for the online SDI, participants in the rapport condition ( $M = 20.91, SD = 6.33$ ) reported greater self-disclosure scores than those in the no rapport condition ( $M = 18.23, SD = 8.65$ ). In contrast, for the paper-and-pencil SDI, participants in the no rapport ( $M = 26.82, SD = 9.34$ ) and rapport conditions ( $M = 27.37, SD = 8.27$ ) did not significantly differ in their scores.

The second interaction showed that scores on the two formats of the Perceived Breadth and Depth of Online Communication (PBD) significantly differed depending on the rapport condition,  $F(1, 116) = 4.27, p = .041$ . For the paper-and-pencil PBD, participants in the no rapport condition ( $M = 22.82, SD = 8.07$ ) reported significantly greater scores than the rapport condition ( $M = 20.32, SD = 8.03$ ). However, for the online PBD, participants in the no rapport ( $M = 23.10, SD = 8.86$ ) and rapport conditions ( $M = 22.77, SD = 9.16$ ) did not significantly differ in their scores.

Main effects of test format and rapport condition were also examined. Significant differences in scores between test formats were found on the SDI, PBD, FROST, Disclosure Probes, and Social Interaction Anxiety Scale-Short Form, all  $F_s > 6.73, p_s <$

.011. The paper-and-pencil formats of the FROST, Disclosure Probes, SDI, and Social Interaction Anxiety Scale-Short Form had higher scores than the online formats. In contrast, the online format of the PBD had higher scores than the paper-and-pencil format. Trends suggested potential main effects of rapport condition for the FROST and Trust in People measures, all  $F_s < 3.93, p_s \leq .050$ . Those in the rapport group reported greater scores on the FROST,  $F(1,116) = 3.77, p = .055$ , and Trust in People measures,  $F(1,115) = 3.93, p = .050$ , than the no rapport group.

**Hypothesis 3a.** Independent samples  $t$ -tests were used to measure differences in state anxiety, measured by the STICSA State Scale, between the two rapport conditions (i.e., rapport and no rapport). For the online format of the measure of state anxiety, there were no significant differences between the rapport conditions,  $t(138) = -.49, p = .628, r^2 = .002$ . Likewise, there were no significant differences in state anxiety between the rapport conditions when using a paper-and-pencil format,  $t(132) = .75, p = .456, r^2 = .004$ .

**Hypothesis 3b.** To assess the mediated relations proposed in hypotheses 3, 4, 5, and 6, Baron and Kenny's (1986) four-step approach was initially used; however, the analyses failed to meet the first criterion of a significant relation between the independent and dependent variables. Because this criterion is frequently not met, other researchers have proposed alternative ways of examining the indirect effect of the relation between the independent variable and the dependent variable through a mediator variable (Collins, Graham, & Flaherty, 1998; MacKinnon, 2000; Preacher & Hayes, 2004; Shrout & Bolger, 2002). Therefore, potential indirect effects in this study were analyzed using the bootstrapping method, as recommended by Preacher and Hayes (2008). The bootstrapping method is preferred because it does not assume that the distributions are

normal (Bollen & Stine, 1990; Efron & Tibshirani, 1993; Mooney & Duval, 1993). This method uses bootstrapping by taking thousands of samples of the indirect effect's distribution and generating 95% confidence intervals. If the bootstrapped confidence interval does not include zero then it is assumed that the indirect effect is statistically significant.

***Bootstrapping for Paper-and-Pencil Format.*** First as part of hypothesis 3b, bootstrapping was used to examine an indirect relation between rapport condition and state anxiety through the potential mediator of perceived rapport. State anxiety was measured using the paper-and-pencil STICSA State Scale and perceived rapport was measured using the paper-and-pencil FROST. A significant indirect relation was not found, 95% CI [-1.19, .61]. Findings suggest that perceived rapport did not mediate the relation between rapport condition and state anxiety when measured using paper-and-pencil measures.

***Bootstrapping for Online Format.*** Next, bootstrapping was used to examine an indirect relation between rapport condition and state anxiety (measured using the online STICSA State Scale) through the potential mediator of perceived rapport (measured by the online FROST). A significant indirect relation was not found, 95% CI [-1.65, .17]. Again, findings suggest that perceived rapport did not mediate rapport condition and state anxiety when measured using online measures. Based on these two bootstrapping analyses, it is unlikely that an indirect effect exists whereby perceived rapport mediates the relation between rapport condition and state anxiety.

**Hypothesis 4a.** ANCOVAs were used to measure score differences in self-disclosure between the two rapport conditions. Self-disclosure was measured using the

online and paper-and-pencil formats of the Disclosure Probes and Self-Disclosure Index. Due to the limitations of the statistical program used, corrections for heteroscedastic data on the online Self-Disclosure Index were not possible for this hypothesis. Though researchers have found that ANCOVAs are robust to heteroscedasticity when normality is not violated (Olejnik & Algina, 1984), results should be interpreted with caution due to the increased chance of a Type 1 error. There were no significant differences in self-disclosure, as measured by the Disclosure Probes, between the rapport conditions for either the paper-and-pencil format,  $F(3,131) = .21, p = .651, r^2 = .104$ , or the online format,  $F(3,137) = .48, p = .490, r^2 = .029$ . Similarly, there were no significant differences in the Self-Disclosure Index scores between the rapport conditions for either the paper-and-pencil format,  $F(3,131) = .02, p = .904, r^2 = .102$ , or the online format,  $F(3,137) = 3.10, p = .081, r^2 = .111$ . Because no significantly different scores on the Disclosure Probes or Self-Disclosure Index were found between conditions, results suggest that rapport conditions did not directly affect willingness to disclose sensitive information. Hypotheses 4b and 4c examine possible indirect relations.

**Hypothesis 4b.** Preacher and Hayes' (2008) bootstrapping method was used to assess potential indirect effects between rapport condition and self-disclosure (measured by the Disclosure Probes and Self-Disclosure Index) through state anxiety, measured by the STICSA State Scale.

**Disclosure Probes.** First, bootstrapping was used to examine an indirect relation between rapport condition and self-disclosure through the potential mediator of state anxiety using the paper-and-pencil version of the Disclosure Probes and STICSA State Scale. A significant indirect relation was not found, 95% CI [-.10, .12].

Second, bootstrapping was used to assess an indirect relation between rapport condition and self-disclosure through state anxiety using the online Disclosure Probes and the online STICSA State Scale. A significant indirect relation was not found, 95% CI [-.30, .05].

***Self-Disclosure Index.*** Bootstrapping also was used to assess an indirect relation between rapport condition and self-disclosure through the potential mediator of state anxiety using the paper-and-pencil version of the Self-Disclosure Index and the STICSA State Scale. A significant indirect relation was not found, 95% CI [-.69, .13].

Finally, bootstrapping was used to examine an indirect relation between rapport condition and self-disclosure (measured using the logarithmic transformation of the online Self-Disclosure Index) through state anxiety using the online version of the Self-Disclosure Index and STICSA State Scale. The logarithmic transformation of the online Self-Disclosure Index was used for this analysis due to heteroscedastic residuals. A significant indirect relation was not found, 95% CI [-.01, .02].

Based on these bootstrap results, it is unlikely that an indirect relation exists between rapport condition and self-disclosure through state anxiety. This finding was obtained using both the paper-and-pencil and online formats of the two measures of self-disclosure.

**Hypothesis 4c.** Preacher and Hayes' (2008) bootstrapping method was used to examine potential indirect effects between rapport condition and self-disclosure (measured by the Disclosure Probes and Self-Disclosure Index) through the potential mediator of perceived rapport (measured by the FROST).

**Disclosure Probes.** First, bootstrapping was used to examine an indirect relation between rapport condition and self-disclosure through perceived rapport using the paper-and-pencil format of the Disclosure Probes and the FROST. A significant indirect relation was not found, 95% CI [-.08, .39]. In addition, the same analysis was conducted using the online versions of these measures and a significant relationship was not found, 95% CI [-.03, .42].

**Self-Disclosure Index.** Bootstrapping also was used to assess an indirect relation between rapport condition and self-disclosure through perceived rapport using the paper-and-pencil version of the Self-Disclosure Index and the FROST. A significant indirect relation was found, 95% CI [.29, 3.07]. The rapport condition was related to greater perceived rapport, which in turn was related to increased self-disclosure.

Finally, bootstrapping was used to assess an indirect relation between rapport condition and self-disclosure through perceived rapport using the online version of the Self-Disclosure Index and the FROST. A significant indirect relation was not found, 95% CI [-.09, 1.40].

Taken together, an indirect relation was found between rapport condition and self-disclosure through perceived rapport when self-disclosure was measured using the paper-and-pencil Self-Disclosure Index. However, this relation did not hold for the online format of the Self-Disclosure Index. Additional bootstrap results suggest that it is unlikely that an indirect relation exists between rapport condition and self-disclosure through perceived rapport when self-disclosure is measured using the Disclosure Probes.

**Hypothesis 5a.** Repeated measures ANCOVAs were used to measure score differences on the Disclosure Probes and Self-Disclosure Index between the two test

formats to determine if there was significantly more self-disclosure online. In contrast to previous research (e.g., Suler, 2004), both measures did not show significantly more self-disclosure on the online measures than paper-and-pencil. The paper-and-pencil Disclosure Probes did not have significantly different self-disclosure scores ( $M = 21.26$ ,  $SD = 2.80$ ) than its online format ( $M = 20.68$ ,  $SD = 3.60$ ),  $F(1, 116) = 1.39$ ,  $p = .241$ . Furthermore, the paper-and-pencil Self-Disclosure Index did not have significantly different self-disclosure scores ( $M = 27.08$ ,  $SD = 8.81$ ) than did its online format ( $M = 19.53$ ,  $SD = 7.70$ ),  $F(1, 116) = 0.01$ ,  $p = .923$ .

**Hypothesis 5b.** Linear regression was used to examine the relation between social anxiety, measured by the SIAS-SF, and self-disclosure measured by the Disclosure Probes and Self-Disclosure Index.

**Disclosure Probes.** In the regression assessing whether scores on the paper-and-pencil Disclosure Probes were associated with paper-and-pencil SIAS-SF scores, greater social anxiety significantly predicted less self-disclosure,  $\beta = -.19$ ,  $t(131) = -2.38$ ,  $p = .019$ . Social anxiety explained a significant proportion of the variance in self-disclosure scores,  $F(2, 131) = 10.65$ ,  $p < .001$ ,  $R^2 = .14$ .

Second, a simple linear regression was calculated to assess whether scores on the square root transformed online Disclosure Probes were associated with online SIAS-SF scores. The regression equation approached statistical significance,  $\beta = .15$ ,  $t(137) = 1.84$ ,  $p = .069$ ,  $R^2 = .05$ . Trends showed that greater social anxiety was associated with less self-disclosure.

**Self-Disclosure Index.** For the regression assessing whether scores on the paper-and-pencil Self-Disclosure Index were associated with SIAS-SF scores, greater social

anxiety significantly predicted less self-disclosure,  $\beta = -.20$ ,  $t(131) = -2.45$ ,  $p = .016$ . Social anxiety also explained a significant proportion of the variance in self-disclosure scores,  $F(2, 131) = 10.78$ ,  $p < .001$ ,  $R^2 = .141$ . Similar, the regression that assessed whether scores on the online Self-Disclosure Index were associated with SIAS-SF scores demonstrated that greater social anxiety predicted less self-disclosure,  $\beta = -.17$ ,  $t(137) = -2.12$ ,  $p = .036$ ,  $R^2 = .12$ .

In summary, social anxiety was found to significantly predict self-disclosure on both paper-and-pencil forms of self-disclosure (Disclosure Probes and Self-Disclosure Index) and the online Self-Disclosure Index. Specifically, the greater participants' social anxiety scores, the less likely they were to self-disclose information. Though social anxiety was not found to significantly predict self-disclosure on the online Disclosure Probes, trends showed that as social anxiety scores increased, self-disclosure scores decreased.

**Hypothesis 6a.** The overall frequency of test format preference was measured from 119 participants that completed both parts of the study. Of these participants, 77 preferred the online test format (64.7%) and 42 preferred the paper-and-pencil format (35.3%).

**Hypothesis 6b.** One-way ANCOVAs were used to examine differences in computer competency, measured by the Internet Self Efficacy scale (ISE), between test format preference groups (paper-and-pencil or online). Those who preferred the online format did not have significantly different scores on the paper-and-pencil ISE ( $M = 40.27$ ,  $SD = 6.41$ ) compared to those who preferred the paper-and-pencil format ( $M = 40.81$ ,  $SD = 6.53$ ),  $F(3, 116) = .22$ ,  $p = .639$ ,  $r^2 = .043$ . Additionally, those who preferred

the online format did not have significantly different scores on the online ISE ( $M = 40.82$ ,  $SD = 6.84$ ) than those who preferred the paper-and-pencil format ( $M = 38.40$ ,  $SD = 7.98$ ),  $F(2, 112) = 2.90$ ,  $p = .092$ ,  $r^2 = .025$ .

Due to order effects previously found using the online ISE, differences in internet self-efficacy scores based on format preference also were compared, factoring in the order in which they completed the ISE. None of these analyses revealed order effects in preferred format differences in ISE scores,  $F_s < 1.81$  and  $p_s > .181$ . Overall, results suggest that participants' test format preference was not related to the amount of Internet self-efficacy that participants reported.

**Hypothesis 6c.** Independent samples  $t$ -tests were used to examine differences in social anxiety, measured by the SIAS-SF, between test format preference groups. Those who preferred the online format did not report significantly more social anxiety on the online SIAS-SF ( $M = 5.72$ ,  $SD = 4.23$ ) compared to those who preferred the paper-and-pencil format ( $M = 5.58$ ,  $SD = 3.88$ ),  $t(112) = .18$ ,  $p = .861$ ,  $r^2 < .001$ . Similarly, those who preferred the online format did not report significantly more social anxiety on the paper-and-pencil SIAS-SF ( $M = 7.05$ ,  $SD = 5.20$ ) than those who preferred the paper-and-pencil format ( $M = 7.21$ ,  $SD = 5.70$ ),  $t(117) = -.16$ ,  $p = .875$ ,  $r^2 < 0.001$ . This suggests that social anxiety was not associated with participants' test format preferences.

Percentages of format preference were also examined for participants who reported having specific psychological disorders. Forty-four percent of participants with anxiety disorders ( $n = 4$ ), 62.5% of participants with other psychological disorders (e.g., depression, ADHD;  $n = 5$ ), and 66.7% of participants without a disorder ( $n = 68$ )

preferred the online test format. Of the participants with anxiety disorders, one had social anxiety and reported having an online test format preference.

**Summary of Main Hypotheses.** Taken together, the findings of this study suggested the following: In general, analyses for the first hypothesis found that participants assigned to the rapport condition perceived significantly greater rapport, but only when the test administrator was present (not online). Analyses for the second hypothesis found that all paper-and-pencil measures were significantly correlated with their online counterparts. Further examination revealed some interaction effects whereby scores on the two formats of the Self-Disclosure Index and Perceived Breadth and Depth of Online Communication (PBD) differed depending on their rapport condition. Specifically, participants in the rapport condition reported greater self-disclosure scores online than those in the no rapport condition, but this difference was not found on the paper-and-pencil version of the SDI. For the paper-and-pencil PBD, participants in the no rapport condition reported significantly greater scores than the rapport condition. However, for the online PBD, participants in the no rapport and rapport conditions did not significantly differ in their scores. The third hypothesis sought to test an indirect effect between rapport condition and state anxiety through perceived rapport; however, one was not found. Results from the fourth hypothesis suggested that rapport conditions did not directly affect willingness to disclose sensitive information, so indirect relations were examined. An indirect relation between rapport condition and self-disclosure through state anxiety was not found, but an indirect relation was found between rapport condition and self-disclosure (measured by the paper-and-pencil Self-Disclosure Index) through perceived rapport. Contrary to the fifth hypothesis, participants did not show significantly

more self-disclosure on the online format than the paper-and-pencil format. Consistent with the fifth hypothesis, higher social anxiety scores were associated with lower self-disclosure scores. Results of the sixth hypothesis suggested that the majority of participants reported preferring the online format, but contrary to this hypothesis, results suggested that participants' test format preference was not based on the amount of Internet self-efficacy or social anxiety that participants reported.

### **Supplementary Analyses**

**Trust.** Participants were asked four questions about how much they trust the Internet and its functions on both the online and paper-and-pencil formats of the Background Information Questionnaire. First, participants reported most frequently on the paper-and-pencil ( $n = 44, 32.8\%$ ) and online ( $n = 48, 34.3\%$ ) formats that they “moderately distrust” the Internet to keep their information confidential. Second, when asked how much they trusted the Internet to relay information they send to the desired party, the majority of participants on the paper-and-pencil ( $n = 82, 61.7\%$ ) and online formats ( $n = 89, 65.0\%$ ) reported that they “moderately trust” it. Third, when asked about the proportion of websites they trusted, participants on the paper-and-pencil ( $n = 54, 40.9\%$ ) and online formats ( $n = 76, 54.3\%$ ) most frequently reported “I trust some websites”. Finally, participants most frequently reported that they feel “slightly anonymous” when sending information online on the paper-and-pencil ( $n = 54, 40.3\%$ ) and online formats ( $n = 53, 38.1\%$ ). It is also important to note that only 2.2% ( $n = 3$ ) of participants on the paper-and-pencil format and 2.2% ( $n = 3$ ) on the online format reported they feel completely anonymous when sending information online.

Overall, many participants reported not completely trusting the Internet to keep their information confidential, moderately trusting the Internet to relay their information appropriately, and not trusting the majority of websites. Furthermore, less than three percent of participants reported feeling completely anonymous online.

Additional analyses were conducted to further examine participants' propensity to trust. Specifically, the amount of trust participants reported having in other people was examined in relation to their trust in the Internet. A median split was conducted whereby two groups were formed from scores on the Trust in People scale: high trust in people and low trust in people. *T*-tests were then conducted to determine group differences in regards to their trust in websites. Participants with low trust in people reported trusting significantly fewer websites than participants with high trust in people for both the paper-and-pencil,  $t(129) = 2.84, p = .005$ , and online measures,  $t(114) = 2.95, p = .004$ . This finding was replicated using the People Can Trust question which also dichotomized participants into two groups based on their opinion that most people can, or cannot, be trusted. Participants who believed that most people cannot be trusted reported trusting significantly fewer websites than participants who believed that most people can be trusted for both the paper-and-pencil,  $t(129) = -3.94, p < .001$ , and online measures,  $t(114) = -4.41, p < .001$ .

A median split was then conducted on the scores of the trust in websites item from the Background Information questionnaire forming two groups: participants who trust many websites and participants who trust few websites. ANCOVAs were conducted to determine group differences with regards to their self-disclosure. Participants who trusted many websites reported significantly greater self-disclosure on the online SDI

than participants who trusted few websites,  $F(3, 137) = 6.30, p = .013$ . However, this finding was not replicated when self-disclosure was measured by the paper-and-pencil SDI,  $F(3, 129) = 1.43, p = .234$ . Overall, there is evidence that participants with greater trust in people reported greater trust in websites and that participants with greater trust in websites reported greater willingness to self-disclose information online.

**Participants' Feedback.** Participants completed a debriefing questionnaire at Time 2 regarding their opinions on the rapport building script, online rapport building video, and the test administrator. When participants in the rapport condition were asked how much they liked the introduction, participants most frequently reported that they “greatly liked being introduced” ( $n = 30, 49.2\%$ ). When they were asked about the duration of the introduction, the majority reported that they felt the introduction was “neither long or short” ( $n = 41, 67.2\%$ ). Third, participants in both conditions were asked which gender they preferred for their test administrator. The majority of participants reported “I do not have a gender preference for the test administrator” ( $n = 101, 82.1\%$ ) and the remaining participants reported “I preferred having a female test administrator” ( $n = 22, 17.9\%$ ). Finally, participants in both conditions were asked about their perception of the role of the test administrator. The majority of participants reported that they saw the test administrator as “a test administrator” ( $n = 46, 54.8\%$ ).

In summary, most participants greatly liked being introduced to the test administrator prior to completing the measures, believed the introduction was a suitable length, and perceived the test administrator to be a “test administrator.” Most participants did not have a gender preference for the test administrator and those who did preferred having a female test administrator.

## CHAPTER V

### DISCUSSION

The goal of this study was to examine how asynchronous rapport prior to test administration may affect online and paper-and-pencil measures of state anxiety, self-disclosure, and perceived rapport with the test administrator. The consistency of scores on both formats of all measures was also examined. By examining asynchronous rapport in an online testing environment, this study expanded on previous research on relationship building during online therapy.

#### **Effectiveness of the Rapport Video/Script**

An in-person script and online video were created in order to build asynchronous rapport with participants prior to testing. To assess whether these rapport-building procedures were effective, a new measure named the FROST was created using factor analysis in order to measure participants' perceived rapport with the test administrator. The FROST was administered in both online and paper-and-pencil formats. Participants in the asynchronous rapport conditions provided feedback regarding their impressions of the rapport script and video. Participants stated that they enjoyed being introduced to the test administrator. Furthermore, the majority of participants also thought that the introduction was an appropriate length (67 seconds long). This falls within the time range of other forms of media that seek to gain individuals' interest such as movie trailers (<150 seconds; Motion Picture Association of America Inc., 2012) and television commercials (5 to 120 seconds; Television Bureau of Canada, 2015). Finally, results demonstrated that participants either did not have a gender preference for the test administrator or preferred having a female test administrator. Note that in this study the majority of participants were female and the test administrator was female. The female

test administrator preferences reported are consistent with previous research on automatic in-group bias and gender perceptions (Rudman & Goodwin, 2004). Specifically, researchers have found that women automatically liked other women more than men automatically liked other men and both sexes associated more positive characteristics (e.g., good, happy) to women more than men (Rudman & Goodwin, 2004). Overall, this suggests that the introduction met participants' expectations of an enjoyable introduction.

Differences in scores of perceived rapport between the two rapport groups were also examined. Rapport condition was found to significantly predict perceived rapport on the paper-and-pencil format of the FROST. Those in the rapport condition reported greater perceived rapport with the test administrator than those in the no rapport condition. Specifically, participants endorsed items on the FROST such as feeling more comfortable, accepted, understood as well as perceiving the test administrator to be accepting, empathic, friendly, and warm. These characteristics reflect the descriptions of Tickle-Degnen and Rosenthal's (1990) mutual attentiveness and positivity.

The perception of asynchronous rapport reported by participants was greater in-person than online. In other words, the online asynchronous rapport video was related to lower scores on the FROST than the in-person introduction despite their identical scripts. This suggests that some elements of in-person interactions contribute to rapport above and beyond what online interactions can. The primary difference between the two test formats in this study was having the test administrator physically present or absent. It is well documented in attachment research that physical comfort and proximity to someone they feel safe with helps form positive relationships or bonds (Bowlby, 1988; Harlow, 1958). Similarly, having a friendly test administrator physically present may foster a

sense of having a secure base more than online rapport. Just knowing that the test administrator was physically nearby to interact with if needed may have founded trust and rapport.

That is not to say that online asynchronous rapport was not reported. Even though a significant relation with rapport condition was not found, mean scores on the online format of the FROST were greater for the rapport condition ( $M = 167.90, SD = 23.46$ ) than the no rapport condition ( $M = 163.06, SD = 22.50$ ). It is possible that the FROST measure does not perfectly measure perceived rapport online. Because rapport has traditionally been studied in in-person contexts and many of the items came from this literature, it is possible that the items do not reflect rapport online. For example, many individuals form relationships online based on similar interests (e.g., online gaming, dating websites, forums, blogs). The FROST did not include items that measured how much participants' felt their interests matched the test administrator's interests that were discussed in the script (e.g., spending time with family, learning about psychological disorders). Because of potential item omissions during the FROST's creation, this may explain why trends were found online but significant relations were not. Further research may be needed in order to generate more items that represent online asynchronous rapport.

### **Consistency of Online vs Paper-and-Pencil Measures**

When tests are transformed from paper-and-pencil format to an online format, the reliabilities of the tests are questioned. Hypothesis 2 tested the consistency of test scores across formats. This hypothesis was partially supported. Strong correlations between the formats of all tests were found. However, scores on three of the measures (FROST,

Perceived Breadth and Depth of Online Communication, and SIAS-SF) were statistically different between the online and paper-and-pencil formats. This suggests that even though the test formats were correlated and scores covaried in the same direction regardless of format, when test format was examined explicitly participants' scores vary.

When further examined, the analyses of the scores on the SDI and Perceived Breadth and Depth of Online Communication revealed an interaction between test format and rapport condition. First, self-disclosure on the online SDI was significantly greater than the paper-and-pencil SDI for the rapport condition but not for the no rapport condition. This suggests that the combination of being in the rapport condition and receiving the online test format was related to greater self-disclosure (see Self Disclosure section below for further explanation). Second, although perceived breadth and depth of online communication did not differ between the conditions on the online PBD, those in the no rapport condition had greater scores on the paper-and-pencil PBD than those in the rapport condition. This finding was inconsistent with the second hypothesis. One possible explanation is that the no rapport condition perceived online communication to have more breadth and depth since they did not receive warmth and friendliness in face-to-face communication with the test administrator.

### **State Anxiety**

Hypothesis 3 proposed that state anxiety would be influenced by rapport condition and perceived rapport. However, results from this study did not support this hypothesis. Those in the asynchronous rapport condition did not have a lower level of state anxiety than those in the no rapport condition, and there was no indirect relation between rapport condition and state anxiety through perceived rapport. The amount of

state anxiety participants reported on the STICSA State Scale in the present study (paper-and-pencil  $M = 33.30$ ,  $SD = 10.07$  and online  $M = 33.63$ ,  $SD = 10.77$ ) is similar to what other researchers have found in non-clinical undergraduate populations using this measure without anxiety provoking stimuli ( $M = 33.57$ ,  $SD = 12.44$ ; Roberts, Hart, & Eastwood, 2015). It is possible that this study was not anxiety provoking to most participants. Because participants reported average levels of state anxiety, rapport was not necessary to alleviate it. This may explain why rapport was not related to significantly lower state anxiety. It is possible that in testing situations that are more anxiety provoking, or conducted with clinical populations, asynchronous rapport may be associated with lower state anxiety scores.

### **Self-Disclosure**

Rapport has been found to facilitate self-disclosure in therapy settings with clients (Farber, Berano, & Capobianco, 2004; Leibert et al., 2006). Results from this study found some evidence that this finding can be applied to online testing environments. Participants in the asynchronous rapport conditions did not significantly self-disclose more responses or report that they would be more likely to disclose to the test administrator than those in the no rapport conditions. Trends showed that those in the rapport conditions did report greater self-disclosure though not-significant. However, upon further examination of potential interaction effects, self-disclosure on the online Self-Disclosure Index was significantly greater than the paper-and-pencil SDI for the rapport condition but not for the no rapport condition. This suggests that even though perceived rapport was not significantly greater online for the rapport condition than the no rapport condition, the combination of being in the rapport condition and receiving the

online test format was related to greater self-disclosure. Previous research has suggested that, individually, communicating online (Suler, 2004) and building rapport (Farber, Berano, & Capobianco, 2004) fosters self-disclosure. This was the first study to examine the interaction of these two influences on self-disclosure. Together, receiving the online test format and online asynchronous rapport-building video were related to increased self-disclosure. It is possible that when psychological tests require self-disclosure of sensitive information, administering the tests online and preceding them by an asynchronous rapport-building video, may foster more self-disclosure than traditional paper-and-pencil test administration.

Unlike previous research, the present study did not use a clinical sample. The majority of participants did not report having psychological disorders or undergoing treatment. As part of the definition of having a psychological disorder and a need for treatment is the presence of significant distress (American Psychiatric Association, 2013), which can hinder self-disclosure. Because the majority of participants were not clinically distressed to begin with, they may not have been hesitant to disclose information on the measures of this study, as clinical populations might be. Thus, the evidence that there was greater self-disclosure from participants in the rapport condition, but not enough to be statistically different from those in the no rapport conditions, may be the result of using a primarily nonclinical population.

Mediation analyses were conducted to determine the possibility of indirect effects on self-disclosure. State anxiety and perceived rapport with the test administrator were examined as mediators. Though higher scores of state anxiety were hypothesized to result in less self-disclosure and mediate the relationship between rapport condition and self-

disclosure, this was not supported. As previously mentioned, it is possible that the present study was not anxiety-provoking resulting in similar levels of state anxiety reported by participants across all conditions. The restricted range of state anxiety scores may be making it more challenging to detect an indirect effect.

Similarly, little evidence was found to support the hypothesis that perceived rapport mediates the relationship between rapport condition and self-disclosure. Of the four regressions conducted, only one found a significant indirect effect. Specifically, the asynchronous rapport condition was related to greater perceived rapport, which in turn was related to increased self-disclosure on the paper-and-pencil SDI. This relationship was not found for the online SDI or either format of the behavioural measure of self-disclosure (Disclosure Probes). The conflicting results may reflect the removal of the synchronous interaction component of rapport (i.e., coordination). Although verbal synchronous interaction (i.e., talking back and forth) did not occur in any conditions, minute observations of non-verbal synchronous interactions were noted in the in-person asynchronous rapport condition. For example, synchronous mirroring naturally occurred whereby after the test administrator smiled during the script some participants also smiled. It is expected that few participants, if any, mirrored the online video with their facial expressions and participants in the no rapport conditions were not primed with gestures or facial expressions to mirror. Mirroring has been associated with individuals feeling more connected (Jacoboni, 2008). This small example of non-verbal synchronous interaction may partially account for greater perceived rapport and self-disclosure. Where previous research has found that rapport (including the component of coordination)

facilitates self-disclosure (Farber, Berano, & Capobianco, 2004), the present study found mixed results and further examination is warranted.

In hypothesis 5a it was hypothesized that the amount of self-disclosure would be greater online due to the online disinhibition effect (Suler, 2004). However, in contrast to previous research, this hypothesis was not supported. Participants reported similar scores of self-disclosure on the paper-and-pencil measures and the online formats. One explanation for this finding is the limited amount of trust participants reported having in the Internet. The majority of participants stated that in general they do not completely trust the Internet to keep their information confidential and that they do not feel completely anonymous online. The sense of anonymity is thought to be a central part of eliciting the online disinhibition effect (Suler, 2004). Therefore, if participants did not feel any more anonymous online than in other everyday situations, they may not have felt comfortable self-disclosing more information online than on the paper-and-pencil format.

Additional analyses were conducted to test the possibility that participants' trust in others and in the Internet influence their willingness to self-disclose information. Findings suggested that participants with less trust in other people tended to trust fewer websites than did participants who had greater trust in others. It is possible that clients with a tendency to distrust others that seek online psychological services may be more cautious and may critically examine service providers' websites before selecting a provider. Some common website features that clients may be more critical of include: security level, professional appearance, credentials, and statements provided by other clients about the service. Furthermore, results showed that participants who reported trusting fewer websites also reported less self-disclosure online than participants who

reported trusting many websites. Psychologists and test publishers should therefore strive to maximize the legitimacy of their websites to foster both clients' trust and self-disclosure online.

Social anxiety was also hypothesized to have a role in how much information participants choose to disclose. Consistent with hypothesis 5b, this study found that higher levels of social anxiety were associated with less self-disclosure. This result is consistent with past literature indicating that those with social anxiety self-disclose less than others due to a fear of interacting with others (including fear of social rejection and/or judgement; Gee, Antony, Koerner, 2013; Voncken & Dijk, 2013).

### **Test Format Preferences**

Consistent with hypothesis 6a, the online test format was preferred more than the paper-and-pencil. However, inconsistent with hypotheses 6b and 6c, those who preferred the online test format were not significantly more competent using the Internet, nor did they have more social anxiety, than those who preferred the paper-and-pencil format. This suggests that test format preferences may be the result of something other than competency using the Internet and social anxiety. A study by Lightstone and Smith (2009) gave university students a choice for the format of their class exams (paper-and-pencil or on a computer). Some of the reasons students gave for choosing the online test format included being more comfortable/familiar with the format, easier to follow, novelty, and less stress. It is possible that participants in the present study based their test format preference on some of these other reasons. In addition to these reasons, future research should examine affordability, scheduling, and convenience as possible reasons for client test format preference. This information would provide test developers with

valuable information regarding which groups of individuals want to use online tests and how they can make them more available to these populations.

### **Limitations and Future Directions**

The current study had several limitations. First, the FROST was a new measure designed for the purposes of this study and requires further examination. As with all new measures, the validity of the measure comes into question. The current study did not test the validity of the FROST and some potential limitations arose. For example, it is possible that the FROST is not accurately assessing asynchronous rapport on both paper-and-pencil and online formats. However, when creating the measure a thorough review of the literature on rapport and therapeutic alliance was conducted. Finally, factor analysis suggested the items were only measuring one factor. To improve the utility of the FROST, future research may include: replication studies, developing norms for different populations and ages, and application to other asynchronous rapport-building situations (e.g., postsecondary lecturers, news reporting). Currently, no cut-off scores or descriptors of scores are available to determine if rapport was poorly or successfully established. Having cut-off scores or descriptors of scores would help test administrators determine if they need to spend more time building rapport (e.g., more smiling, friendly gestures) to comfort examinees or if the level of rapport will affect the validity of examinees' responses. It would also educate test administrators on how they are perceived by clients and if they need to improve their rapport building skills.

Second, the sample size was affected by attrition. This resulted in an incomplete data set for all participants because some participants did not complete both test formats and the debriefing questionnaire. According to G-power calculations, this study had

sufficient power to detect a medium or large effect size. Because many of the analyses had small effect sizes, many of the non-significant results could be explained by not having enough power to be able to detect a significant effect. However, this study was still able to detect some significant relations and trends between variables. Future studies examining relations with asynchronous rapport should anticipate small effect sizes and therefore obtain a larger sample size.

A third limitation of this study was that participants were undergraduate students that did not need to have a psychological disorder to participate and the measures used were not common psychodiagnostic tests. Therefore it is more difficult to generalize these findings to distressed clients who may seek formal online psychological testing. Future research should be conducted with clinical samples of individuals genuinely seeking online psychological testing. In addition, it will also be crucial to examine asynchronous rapport's influence on the clinical psychological tests that test administrators frequently use (e.g., intelligence, psychoeducational, personality). This includes its influence on the newly adapted online formats of tests (e.g., Conners 3). This research is necessary in order to provide the most effective online testing experience for both the client and test administrator. For example, studies regarding the state anxiety and self-disclosure levels of parents and teachers completing online questionnaires (e.g., Conners 3) for a child for psychoeducational purposes may be more representative of the population and tests that test administrators encounter. However, it is unknown how asynchronous rapport may affect state anxiety and self-disclosure during clinical questionnaire completion in these populations.

Similar to previously mentioned concerns with online therapy, this research has limitations regarding its online component. Though steps were taken to ensure that links to the online website were only sent to the participants' e-mail address, it cannot be certain if participants completed the surveys alone or if they watched the entire online video. There was no control over the environment in which they completed the online study which may have affected their mood (e.g., anxiety) or their attention to the tasks. For example, if participants did not attentively watch the online asynchronous rapport video, they may not have felt strong rapport with the test administrator, resulting in lower scores on the FROST than the paper-and-pencil format. Similarly, scores on the STICSA State Scale are based on how participants feel in the moment and could thus be influenced by the environment in which participants complete the measure. Completing the online STICSA in a place of comfort (e.g., home) may contribute to the unelevated state anxiety scores reported by participants after answering sensitive questions on the Disclosure Probes.

Although this does provide an experimental limitation, these conditions are similar to how other psychological services are offered online. For example, *TalkSpace* (over 70,000 users) and *BetterHelp* (over 100,000 users) provide asynchronous psychological services online with licensed counselors via e-mail, private chat rooms, and smartphone apps. Companies like these advertise how convenient they are because clients can access the online services no matter where they are. The counselors have no control over the clients' environment but it appears that the perceived benefits of access anywhere outweigh this limitation. Though the present study does not have a standardized online testing environment, findings are more representative of how online

psychological services are meant to be used, and are currently being used by thousands of individuals, every day.

Finally, this was the first use of a script and online video to build asynchronous rapport with participants. The test administrator who attempted to build asynchronous rapport was kept constant in-person and online for all participants. That is to say that all participants were interacting with the same test administrator at every point of the study. Therefore, it is unknown whether these findings can be generalized to other test administrators or others performing the online video. The test administrator in the present study had graduate level training in test administration with clients. Though it cannot be assumed that all test administrators are the same, they should all hold professional credentials (e.g., psychological license, graduate degree) from organizations or institutions where they had to demonstrate competency interacting with clients in a professional, respectable manner, similar to the training the current test administrator demonstrated. It is possible that test administrators with similar clinical training to the current study's test administrator may also demonstrate warmth and care to foster asynchronous rapport. Further research is needed with multiple test administrators to assess the generalizability of the asynchronous rapport building script.

### **Conclusions and Practical Applications**

The present study found that having a test administrator attempt to build asynchronous rapport with participants in person was related to greater participants' perceived rapport. Additionally, the present study also found that when asynchronous rapport through an online video preceded online measures, greater self-disclosure was reported online. Comforting clients in distressed situations is one of the main roles

psychologists have. By reaching out to clients online as they would in in-person settings, psychologists can fulfill their ethical duty to respect others and provide fair treatment (Canadian Psychological Association, 2000).

Second, this study supports findings from the literature whereby paper-and-pencil formats often maintain the same properties once they have been transformed into online formats (Holländare, Askerlund, Nieminen, & Engstrom, 2008; Kane, Walker, & Schmidt, 2011; Vallejo, Jordán, Diaz, Comeche, & Ortega, 2007; Zlomke, 2009). In the present study, six measures did not have significantly different scores on the two test formats. This is consistent with previous literature regarding the similarity of psychometric properties between online and paper-and-pencil formats. Interestingly, a few measures in the present study, including the new unvalidated FROST measure, were not consistent across formats. Though measures of perceived rapport, self-disclosure, social anxiety and perceived breadth and depth of online communication were highly correlated between the two formats, statistically significant differences in scores were noted, suggesting that perhaps not all measures are successfully transformed into online formats. Elements of in-person tests that are lost during the transformation process to online formats (e.g., the influence of verbal and behavioral interactions with the test administrator) may contribute to score differences. Many in-person psychological tests for intelligence and academic achievement (commonly used to diagnosis learning disabilities) involve the use of manipulatives and responses that are oral or hand-written (e.g., WISC-IV and WIAT-III). Incorporating these components of testing into an online format may pose a challenge to test developers. Fortunately, not all tests of intelligence and academic achievement have these components and have successfully been published

as computer-based tests with on-screen administration (e.g., Reynolds Adaptable Intelligence Test and Basic Achievement Skills Inventory). Should test administrators choose to use newer online tests such as the Basic Achievement Skills Inventory, it may change how learning disabilities are diagnosed in the future. Therefore, test developers and administrators need to be aware of potential differences between test formats and how these differences may influence decisions based on online measures.

Furthermore, some evidence was found that self-disclosure could be predicted from social anxiety. Specifically, lower social anxiety predicts greater self-disclosure. Increased self-disclosure from clients is particularly important for test administrators that administer tests used for diagnostic purposes because it allows for a thorough assessment. In the present study, self-disclosure on the Self-Disclosure Index was greatest when participants watched a rapport-building video prior to completing the measure online. This finding may be of particular importance to test administrators that administer online tests to clients living in other areas (e.g., rural areas). Because they may not be able to meet the client in person, gathering as much valuable information online as possible is essential. It is possible that fostering rapport online with clients and allowing them to complete measures online will yield greater self-disclosure than traditional paper-and-pencil measures. Therefore, test developers should continue to encourage test administrators to establish rapport not only with their in-person clients, but also with their online clients.

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## APPENDICES

### Appendix A

#### Summary Table of Measures

Measure	Study Variable	Number of Items	Analysis
Background Information	Background Information	14	DS
Frost's Rapport Observations: Survey of Test administrators (FROST)	Rapport	46	DV, ME
Trust in People (TIP)	Trust/Rapport	5	DV
People Can Trust (PCT)	Trust/Rapport	1	DV
Social Interaction Anxiety Scale-Short Form (SIAS-SF)	Social Anxiety	6	IV, DV, ME
State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA State Scale)	State Anxiety	21	DV, ME
Perceived Breadth & Depth of Online Communication	Perceptions of online communication	9	DV
Self-Disclosure Index (SDI)	Self-disclosure	10	DV
Disclosure Probes	Self-disclosure	24	DV
Internet Self-Efficacy	Internet competence	10	IV
Comfort Level in Interacting with Others Measure	Communication preferences	21	DS
Social Desirability Scale 17 (SDS-17)	Social desirability	16	CV
Debriefing Questionnaire for Asynchronous Rapport Condition	Truthfulness, perception of video and test administrator, and test format preference	17	DV, DS
Debriefing Questionnaire for No Rapport Condition	Truthfulness, perception of test administrator, and test format preference	10	DV, DS

*Note:* IV=Independent Variable, DV=Dependent Variable, ME=Mediator, CV=Covariate, DS=Descriptive Statistics

## Appendix B

### Background Information

Please complete the following questionnaire by selecting your response and filling in the blanks accordingly.

1. Gender \_\_\_\_\_
2. Age \_\_\_\_\_ Years \_\_\_\_\_ Months
3. Ethnicity  Aboriginal (Inuit, Metis, North American Indian)  
 Arab/West Asian (e.g., Armenian, Egyptian, Iranian, Lebanese)  
 Black (e.g., African, Haitian, Jamaican, Somali)  
 Asian (e.g., Chinese, Filipino, Korean, Japanese)  
 White (Caucasian)  
 Latin American  
 Other *please specify* \_\_\_\_\_
4. Year of studies  1  2  3  4  5 or more
5. Program of study \_\_\_\_\_
6. Have you ever been diagnosed with a psychological disorder(s)?  
 Yes  No  
  
If yes, please check all that apply:  
 Generalized Anxiety Disorder (GAD)  
 Social Anxiety Disorder  
 Specific Phobia  
 Obsessive Compulsive Disorder (OCD)  
 Other (please specify) \_\_\_\_\_
7. Are you currently taking medication for a psychological disorder(s)?  
 I do not have a psychological disorder  
 I have a psychological disorder but am not taking medication  
 Yes, I am taking medication for a psychological disorder

8. Are you currently participating in therapy for a psychological disorder(s)? Check all that apply.

- I do not have a psychological disorder
- I have a psychological disorder but am not participating in therapy
- I am participating in therapy with a psychologist for a psychological disorder
- I am participating in therapy with a social worker for a psychological disorder
- I am participating in therapy with another professional for a psychological disorder
- I am participating in group therapy for a psychological disorder
- I am participating in another type of therapy not previously mentioned for a psychological disorder

9. Have you ever been diagnosed with a physical disability(ies)?

- Yes
- No

If yes, please check all that apply:

- Visual impairment (e.g., blindness, restricted eye sight, colour blindness, other visual impairments)
- Hearing impairment (e.g., deafness, hearing loss, other hearing impairments)
- Motor impairment (e.g., paralysis, involuntary movements, physical injury, muscle disease, other motor impairments)

10. Do you use educational resources (such as adaptive technology, alternative exam accommodations, or other resources through Student Disability Services)?

- Yes
- No

11. How much do you trust the Internet to keep your information confidential?

- Completely Trust
- Moderately Trust
- Neither Trust or Distrust
- Moderately Distrust
- Completely Distrust

12. How much do you trust the Internet to send your information to the desired party?

- Completely Trust
- Moderately Trust
- Neither Trust or Distrust
- Moderately Distrust
- Completely Distrust

13. What proportion of websites do you trust?

- I trust all websites
- I trust the majority of websites
- I trust some websites
- I trust only a few websites
- I don't trust any websites

14. How anonymous do you feel when sending information online?

Completely anonymous

Moderately anonymous

Slightly anonymous

Not at all anonymous



18. That my responses will be misunderstood by the test administrator.

19. I can be myself with the test administrator.

20. Inferior to the test administrator.

21. I can trust the test administrator.

22. The test administrator trusts me.

23. Comfortable disclosing sensitive information to the test administrator.

24. Uncomfortable risking sensitive information with the test administrator.

Please complete the following items on how much you agree or disagree regarding *how the test administrator seems to you*.

Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
1	2	3	4	5

### **THE TEST ADMINISTRATOR SEEMS...**

1. Calm

2. Unprofessional

3. Trustworthy

4. Impersonal

5. Accepting

6. Disrespectful

7. Empathic

8. Distant

9. Interested in me

10. Superficial

11. Intimidating

12. Professional
13. Dishonest
14. Friendly
15. Judgemental
16. Courteous
17. Unfeeling
18. Warm
19. Uninterested in me
20. Sincere
21. Naive
22. Dependable

## Appendix D

### Asynchronous Rapport Script

*\*smile\**

Welcome to the study and thank you for choosing to take part in it. I want to start

*\*hand gesture to self\**

by telling you a bit about myself before you begin. My name is Natalie and I will be your test administrator today. I am a graduate student at the University of Windsor in the Child Clinical Psychology Program. Someday I hope to be a child psychologist, but for now I

*\*stop smile r hand then l hand\**

enjoy learning all about other people and their likes, dislikes, strengths, and weaknesses.

*\*smile\**

When I'm not conducting research, I enjoy spending time with my sister. She has a psychological disability and I think my research may be beneficial to her and others with disabilities. That is why I'm so grateful that you and others have chosen to participate in

*\*stop smile\**

my study. I look forward to learning from this research. Just to let you know, in this study you'll be completing 14 questionnaires about yourself that will take you approximately

*\*gentle shake head\**

30 minutes. All of the information you give will be kept confidential. Your name will not be linked to your responses and your responses will only be viewed by the research team

*\*smile\**

so I encourage you to answer as honestly as possible. Thank you.

## Appendix E

### Consent Form



### CONSENT TO PARTICIPATE IN RESEARCH

Title of Study: *My Experience as a Research Participant.*

You are asked to participate in a research study conducted by Natalie Frost (MA candidate) under the supervision of Dr. Kimberley Babb (Professor), from the Department of Psychology at the University of Windsor. The results of this research will contribute to Natalie Frost's Masters Thesis.

If you have any questions or concerns about the research, please feel to contact Natalie Frost at frostn@uwindsor.ca, or the faculty supervisor, Dr. Kimberley Babb at kbabb@uwindsor.ca and 519-253-3000 ext. 2221.

#### PURPOSE OF THE STUDY

This study will examine participants' opinions, preferences, and perceptions of completing surveys online and in person.

#### PROCEDURES

If you volunteer to participate in this two-part study, you will be asked to:

- 1) Complete a number of paper-and-pencil measures in a lab on-campus..
- 2) Complete a number of online measures one week later. Therefore, it is important that you sign up to participate at a time in which you can participate in both parts of the study 7 days apart (e.g., available to participate on two Tuesdays).

The surveys in both parts of the study examine:

- Your opinion on the introduction given prior to the study
- Your thoughts and feelings in the moment during the study
- Your preferences for different survey formats and communication methods
- Your level of comfort and trust disclosing sensitive information
- How you use technology

The paper-and-pencil survey will be completed independently in a lab on-campus. Participants will receive 0.5 bonus points for 30 minutes of participation in the first part of the study (i.e., paper-and-pencil survey) towards the psychology participant pool, if registered in the pool and enrolled in one or more eligible courses.

Upon completion of the survey, you will be directed to sign up for the second part of the study (My Experience as a Research Participant—Part 2) on the Psychology Participant Pool. You will need to sign up for a time slot one week later. You will then be emailed the link to the online survey by the primary investigator (Natalie Frost, frostn@uwindsor.ca) for the second part of the study. You will have 48 hours to complete the online survey from the day you are provided with the survey link. If you do not complete the study within the 48 hour limit, your answers will be deleted from our records and you will not be given bonus points. If the second part of the study is completed, participants will receive an additional 0.5 bonus points for 30 minutes of participation towards the psychology participant pool, if registered in the pool and enrolled in one or more eligible courses.

#### POTENTIAL RISKS AND DISCOMFORTS

We do not anticipate any major risks for this study. You may experience some negative feelings in response to answering sensitive questions that pertain to your relationships and feelings. However, you do not have to answer any questions that you do not feel comfortable answering. Should you require help with emotional reactions as a result of participating in the research, please see the Letter of Information for resources available to you.

## POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY

You will not directly benefit from taking part in this study. Indirectly, you may develop some knowledge about research methods that you may be learning about in psychology courses. The results of this study will be used to inform future researchers, test administrators, and test developers of students' test and research procedure preferences.

## COMPENSATION FOR PARTICIPATION

Participants will receive 0.5 bonus points for 30 minutes of participation in the first part of the study (i.e., paper-and-pencil survey) towards the psychology participant pool, if registered in the pool and enrolled in one or more eligible courses. In addition, participants will receive 0.5 bonus points for 30 minutes of participation in the second part of the study (i.e., online survey) towards the psychology participant pool, if registered in the pool and enrolled in one or more eligible courses.

## CONFIDENTIALITY

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission. Your name will not appear in any reports of this study. Any forms or paperwork containing your name will be kept in a secure place separate from the information about your answers on the survey.

We may wish to use your information from this study in future research studies. Your information will still be confidential and identified only by an identification number and not with your name. In accordance with the American Psychological Association, your data will be kept for five years following the last publication of the data

## PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time before you submit your survey answers without consequences of any kind. If you do not wish to take part in the study once you have started, you may select the "discard responses and exit" button, which will be found at the bottom of every page. However, if you choose to withdraw less than 10 minutes into the survey, you will not receive the 0.5 bonus point. Similarly, if you do not choose to withdraw but complete the survey in less than 10 minutes, you will not receive the 0.5 bonus point. If you choose to withdraw your responses after completing the study, you will have 7 days from the day you completed the survey in the lab to inform the primary investigator (Natalie Frost, [frostn@uwindsor.ca](mailto:frostn@uwindsor.ca)) of your decision. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

## FEEDBACK OF THE RESULTS OF THIS STUDY TO THE PARTICIPANTS

Research findings will be available to participants and will be posted on the University of Windsor Research Ethics Board website. In addition, a copy of the principal investigator's MA thesis will be available to the public in the Leddy Library on the University of Windsor campus.

Web address: www.uwindsor.ca/reb under 'Study Results'

Date when results are available: October 31, 2015

## SUBSEQUENT USE OF DATA

These data may be used in subsequent studies, in publications and in presentations.

## RIGHTS OF RESEARCH PARTICIPANTS

If you have questions regarding your rights as a research participant, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario, N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: ethics@uwindsor.ca

### SIGNATURE OF RESEARCH PARTICIPANT/LEGAL REPRESENTATIVE

I understand the information provided for the study **My Experience as a Research Participant** as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

\_\_\_\_\_  
Name of Participant

\_\_\_\_\_  
Signature of Participant

\_\_\_\_\_  
Date

### SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

\_\_\_\_\_  
Signature of Investigator

\_\_\_\_\_  
Date

## Appendix F

### No Rapport General Instructions

My name is Natalie and I will be your test administrator today. In this study you will be completing a number of questionnaires about yourself. All of the information you give will be kept confidential so I encourage you to answer as honestly as possible.

## Appendix G

### Debriefing Questionnaire for Asynchronous Rapport Condition

Now that you have completed the study, it would be greatly appreciated if you would provide some feedback from your experience as a participant.

1. What do you think this research was examining? \_\_\_\_\_
2. How truthful were your responses?
  - Completely Untrue
  - Mostly Untrue
  - Balance of True and Untrue
  - Mostly True
  - Completely True
3. Did you choose “prefer not to answer” to any questions?
  - Yes
  - No
4. If you did not provide an answer to every question, why didn't you (check all that apply)?
  - I provided an answer to every question
  - Did not feel comfortable answering
  - Questions too personal
  - Did not want the test administrator to know my answers
  - Other (please specify) \_\_\_\_\_
5. Did you encounter any technical difficulties with the online video? Check all that apply.
  - Sound issues
  - Visual display issues
  - Other \_\_\_\_\_
6. How much did you like or dislike being introduced to the test administrator before the study?
  - Greatly liked being introduced
  - Moderately liked being introduced
  - Neither liked or disliked being introduced
  - Moderately disliked being introduced
  - Greatly disliked being introduced

7. The test administrator's introduction was...

- Very long
- Long
- Neither long or short
- Short
- Very short

8. Do you have a gender preference for the test administrator?

- I would have preferred a male test administrator
- I preferred having a female test administrator
- I do not have a gender preference for the test administrator

9. Do you believe the test administrator provided any truthful information about herself in her introduction?

- Yes
- No

If yes, please specify what information you believe was true?

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10. Do you believe the test administrator provided any false information about herself in her introduction?

- Yes
- No

If yes, please specify what information you believe was false.

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11. Describe the test administrator's personality traits and characteristics in one sentence.

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12. Select how fake or real the test administrator's nonverbal behaviours appeared to you *in-person*.

	Completely fake	More fake than real	More real than fake	Completely real
Eye contact	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Smile	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tone of voice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gestures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. Select how fake or real the test administrator's nonverbal behaviours appeared to you in the *online video*.

	Completely fake	More fake than real	More real than fake	Completely real
Eye contact	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Smile	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tone of voice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gestures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. Did you see the test administrator as a "test administrator"?

- Yes
- No

15. If you did not see the test administrator as a "test administrator", did you see them more as...

- A Researcher
- A Student
- An Examiner
- A Tester
- N/A, I saw them as test administrator

16. Specify any information about the test administrator or the study that you would have preferred to know before the study:

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17. Now that you have completed both online and paper-and-pencil formats of the tests, which format did you prefer more?

- Online
- Paper-and-Pencil

## Appendix H

### Debriefing Questionnaire for the No Rapport Condition

Now that you have completed the study, it would be greatly appreciated if you would provide some feedback from your experience as a participant.

1. What do you think this research was examining? \_\_\_\_\_
2. How truthful were your responses?
  - Completely Untrue
  - Mostly Untrue
  - Balance of True and Untrue
  - Mostly True
  - Completely True
3. Did you choose “prefer not to answer” to any questions?
  - Yes
  - No
4. If you did not provide an answer to every question, why didn't you (check all that apply)?
  - I provided an answer to every question
  - Did not feel comfortable answering
  - Questions too personal
  - Did not want the test administrator to know my answers
  - Other (please specify) \_\_\_\_\_
5. Do you have a gender preference for the test administrator?
  - I would have preferred a male test administrator
  - I preferred having a female test administrator
  - I do not have a gender preference for the test administrator
6. Describe the test administrator's personality traits and characteristics in one sentence.  
\_\_\_\_\_  
\_\_\_\_\_
7. Did you see the test administrator as a “test administrator”?
  - Yes
  - No

8. If you did not see the test administrator as a “test administrator”, did you see them more as...

- A Researcher
- A Student
- An Examiner
- A Tester
- N/A, I saw them as test administrator

9. Specify any information about the test administrator or the study that you would have preferred to know before the study:

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10. Now that you have completed both online and paper-and-pencil formats of the tests, which format did you prefer more?

- Online
- Paper-and-Pencil

## VITA AUCTORIS

NAME: Natalie Frost  
PLACE OF BIRTH: Owen Sound, ON  
YEAR OF BIRTH: 1990  
EDUCATION: West Hill Secondary School, Owen Sound, ON, 2008  
University of Waterloo, B.A., Waterloo, ON, 2012