SHYNESS, CONTEXT, AND SOCIAL COMMUNICATIVE BEHAVIOUR

A NEW APPROACH TO THE EXPERIMENTAL STUDY OF SHYNESS: PERSON

BY CONTEXT INFLUENCES ON COMPUTER-MEDIATED SOCIAL

COMMUNICATION

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Abstract

In a series of five studies, I used the Internet and computed-mediated technologies as tools to revisit the longstanding issue within the fields of personality and experimental social psychology: "person by context" interaction on social communicative behaviour. The effects of the personality trait of shyness were examined in visually anonymous and non-anonymous conditions to see if the interaction of the person and context influenced social communication. Participants were paired in dyads and instructed to converse using a text-based online Instant Messenger program. Dyads were randomly assigned to converse with webcams or without webcams. For some types of behaviour (e.g., self-disclosure), shyness and level of visual anonymity interacted (Studies 1 and 2). Shy individuals disclosed more personal information in a visually anonymous context than a visually non-anonymous context. For non-shy individuals, self-disclosure was not influenced by the context. For other types of behaviour (e.g., affective language), the effect of shyness was consistent across context. To determine the specificity of the shyness-anonymity interaction, other person-anonymity interactions were examined (e.g., self-esteem, loneliness, sex of the participants) (Studies 3 and 4). Finally, the influence of the shyness-anonymity interaction on social communicative behaviour was examined in a cooperative performance-related task (Study 5).

These series of studies suggest that anonymity is a particularly salient contextual cue for shy individuals. Furthermore, the moderating effects of anonymity on shyness

do not generalize to other characteristic of the person. Instead, anonymity moderates the other characteristics (e.g., self-esteem) uniquely.

The present findings have theoretical implications to the study of person by context interactions by identifying how such interactions influence specific aspects of social communication. These findings also have practical or clinical implications. For example, the treatment of social difficulties related to high shyness, low self-esteem, or high loneliness, may involve specific treatment plans building off of modifications in anonymity. Shy individuals benefit from using the Internet as a social medium in which they can control the level of anonymity as is demonstrated by their bolder behaviour during visually-anonymous conversations. The present findings also suggest that the Internet and computer-mediated technologies can be used in novel ways to study long-standing questions in personality and experimental social psychology.

Preface

This dissertation follows a stapled thesis format. I, Paul Brunet, am the first author for all 6 of the journal papers presented within (5 empirical, 1 review). The ideas and work, including the design, data collection, data analysis, and manuscript preparation, associated with each paper are primarily my own. Dr. Louis A. Schmidt was a co-author. In his role as my supervisor, he provided guidance, critical feedback, and suggestions in regards to experimental design, data analysis, and write up of the papers.

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Acknowledgement sections can be tricky to write. The key is to find a way to express honest heartfelt gratitude without resorting to writing sappy prose usually reserved for greeting cards. The following are expressions of my genuine gratitude to the people who have helped or supported me throughout the 5 year process of completing the dissertation you currently hold in your hands.

To my supervisor, Louis Schmidt, I owe my appreciation. He was willing to venture into the cyberworld to allow me to pursue my ideas. He taught me to be an effective researcher, and I taught him about net lingo and emoticons ;)

David Shore and Tracy Vaillancourt were incredibly supportive committee members. Through their feedback and guidance, I learnt to be a more competent writer.

Karin Humphreys taught me all the tricks to code transcripts for linguistic content. It is thanks to her that Microsoft Excel and I became friends.

I asked one of my former undergraduate professors, Cynthia Whissell, for her help in coding my transcripts for affective language use. It added a rich layer to my dissertation. Cynthia's dedication to her students, both past and present, truly is remarkable.

Every graduate student from the Department of Psychology, Neuroscience and Behaviour owes their successful completion of their PhD in part to Nancy, Sally, Wendy, Ann, and Gary. I am no exception. These five people are amazing at what they do and made my life so much simpler. I wish I could take them with me.

I cannot imagine my time at McMaster without thinking of Lindsay Bennett. Her fierce loyalty and unwavering support were frequently the kick in the butt that I needed to stay motivated. I will always be willing to share my sour jujubes with her.

I owe my sanity to time spent with my dog, Rembrandt, to playing on the floor with my little cousins, Connor and Paige, to inspirational conversations with Sue Tasker at Williams, and to Thursday walks with Meredith Young and the dogs.

Emilie Tremblay is my friend, my confidante, and my greatest source of laughter. I thank her for being all three…especially on Sundays.

I am fortunate to have siblings who put up with me. In particular, I liked to thank Gil for answering my random late night phone calls, Rachelle for providing normalcy with family dinners, and Roxanne for traipsing around the globe with me.

Parental influence greatly facilitates success. I am fortunate to have parents, Gilles & Louise, who instilled in me a love of learning, and the value of hard word and perseverance. My success as a graduate student, as a researcher, and as a person is a reflection of the supportive atmosphere they created in our family and our home.

I wish I had something insightful to close with, but I don't. Instead, I will merely conclude by saying that my time in the Emotion lab has been truly memorable. To all the past and present members of the lab, thank you for all the crazy times and providing a soundtrack to my years as a graduate student.

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Chapter 1

General Introduction

General Introduction

The search for predictive utility of personality traits has a long and rich history. The early Greeks and Hippocrates described the four humours (e.g., black bile, yellow bile, blood, and phlegm) to understand individual differences in behaviour (see Hergenhahn, 2001). Hippocrates associated the four humours with elements (e.g., earth, air, fire, and water, respectively). Approximately 500 years later (around 2 AD), the Roman physician, Galen added to those associations by pairing each one with a temperament (e.g., melancholic, choleric, sanguine, and phlegmatic, respectively). Nearly two centuries later similar ideas took shape in mainstream psychology when personality theorists (e.g., Allport, Cattell) proposed that personality could be explained by stable and distinct characteristics, which they labelled as traits (Allport, 1927; 1931; Allport & Allport, 1921; Cattell, 1946).

Despite some supporting evidence, the predictive relation between personality traits and behaviour was not as strong as originally expected. Other factors clearly contribute to behaviour such as context. Contextual cues from other people (e.g., body language; Edinger & Patterson, 1983), and the situation (Mischel, Ebbesen, & Zeiss, 1973; Wring & Mischel, 1987), contribute to the behaviour exhibited by others. Interestingly, the effects of context, however, do not appear to influence everyone in the same way. Some individuals exhibit consistent behaviour across many situations, whereas others modulate their behaviour more noticeably across situations (cf. Bem & Allen, 1974). Neither personality traits nor contextual cues alone can fully explain social communicative behaviour. Accordingly, the most complete predictive model should

include both personality characteristics, contextual characteristics, and how the two influence one another. This model has been termed the "person by context" interaction (also called the person by situation interaction).

One limitation of work in the area of person by context interactions has been the limited ability to systematically tease apart and manipulate contextual cues. For example, manipulating facial expression cues while eliminating all other body language cues would be difficult to achieve in a typical face-to-face laboratory setting while maintaining ecological validity. Consequently, the study of social communicative behaviour and person-context interaction has needed new techniques to manipulate and control contextual cues while maintaining ecological validity. Today, there are new computer-mediated technologies that allow for the study of old questions in the fields of personality and experimental social psychology in new ways.

Themes & Goals of the Present Research

The person-context interaction as it applies to social communicative behaviour was the main overarching theme of my graduate research program and this doctoral thesis. In a series of five studies, I investigated the interaction of specific characteristics of person, and of the context, by using new methodological tools. Based on this overarching theme, I developed four main goals to examine: 1) the interactional effects of levels of shyness and differences in context on social communicative behaviour (i.e., the shyness-context interaction), 2) person-context interactions as they apply to differences in anonymity, 3) the specificity of the shyness-context interaction by exploring other person-context interactions, and 4) the Internet as an effective research tool to study

person-context interactions by giving researchers additional control over the contextual cues.

1) To investigate the interactional effects of levels of shyness and differences in context on social communicative behaviour. Most individuals have a level of shyness, which can fall on a continuum of extremely low to extremely high. The personality trait of shyness is highly relevant to social communicative behaviour (for a comprehensive review see Chapter 1). Individuals high in shyness tend to initiate fewer conversations, speak less, and make less eye-contact, whereas individuals low in shyness excel at these types of social communicative behaviour (Pilkonis, 1977). The differences can be explained by the association between higher levels of shyness and the avoidance of, and the heightened self-evaluation during, social interactions (Crozier, 1979; Melchoir & Cheek, 1990). Accordingly, it has been hypothesized that the behaviour exhibited by shy individuals is greatly influenced by contextual cues.

The general behaviour patterns (e.g., avoidance and inhibition) associated with shyness are detrimental to social development (Fordham & Stevenson-Hinde, 1999; Paulsen, Bru, & Murberg, 2006), which has lead to research focused on designing effective intervention plans (Brodt & Zimbardo, 1981; Greco & Morris, 2001). Increasing the understanding of shyness leads to intervention plans that are more likely to be successful. Therefore, it is important to identify precisely how specific contextual cues affect the behaviour, predominantly social communicative behaviour of shy individuals. My research program targeted this need to enhance the understanding of

shyness by investigating the influence of anonymity on specific forms of social communicative behaviour.

2) To explore person-context interactions as they apply to differences in anonymity. Anonymity is achieved through a reduction or elimination of identifying cues (e.g., face, voice). A person-anonymity interaction hypothesis has been proposed, suggesting that an anonymous context would be particularly salient for individuals who experience discomfort or difficulties in non-anonymous social contexts (Roberts, Smith, & Pollock, 2000; Stritzke, Nguyen, Durkin, 2004). For high shy individuals, a reduction in contextual cues (i.e., an increase in anonymity) should ease their heightened self-evaluative cognitions, which in turn should decrease their inhibited social behaviour. Their non-shy peers, however, should behave fairly similarly across anonymous and non-anonymous conditions. The five studies presented in this dissertation were designed to investigate the person-anonymity interaction hypothesis by conducting controlled laboratory experiments using computer-mediated technologies.

3) To examine the specificity of the shyness-context interaction by exploring other person-context interactions. Studying the shyness-anonymity interaction provides useful information about how this interaction influences some forms of social communicative behaviour, but not other forms. However, to fully understand the shyness-anonymity interaction affects social communicative behaviour, it is also beneficial to consider other related person-anonymity interactions. By doing so, it can be determined if the person-anonymity effects are specific to shyness or if they are generalizable to other related but distinct person characteristics (e.g., self-esteem). Self-

esteem has been shown to be associated with certain subtypes of shyness, but not others (Dzwonkowska, 2002; Schmidt & Robinson, 1992).

4) To establish the Internet as an effective research tool to study person-context interactions by giving researchers additional control over the contextual cues.
Anonymity as a contextual cue has received growing attention in the literature since the advent of the Internet (Bargh & McKenna, 2004; Christopherson, 2007). The Internet, through its many functions (e.g., emailing, instant messaging), has become a popular medium of communication and of social interactions. Highly anonymous communication is not only possible via this medium, but is the norm. To explain the popularity in a predominantly anonymous medium of communication, many researchers have turned to individual differences in personality. It has been proposed that individuals who experience difficulties with social interaction via traditional media of communication would be particularly interested in the anonymous medium of the Internet (Roberts, Smith, & Pollock, 2000). For example, the use of the Internet by individuals who are high in shyness (Sheeks & Birchmeier, 2006; Ward & Tracey, 2004) or low in self-esteem (Niemz, Griffiths, & Banyard, 2005) have been examined because of the assumption that they will prefer engaging in anonymous social interactions. However, there have not been any controlled laboratory studies investigating how this anonymous medium influences the effects of individual differences due to personality on specific social communicative behaviour (e.g., self-disclosure, word count). There have been studies that have investigated the effects of anonymity on its own (Joinson, 2001), but apparently none that have combined person with context to investigate the interaction.

Overview and Research Questions

Literature Review. In Chapter 2, I review the shyness literature, focusing particularly on the shyness-context interaction. The review comprises four sections: 1) the shyness phenomenon (i.e., its development and its cognitive, behavioural, and psychophysiological components), 2) shyness and social communicative behaviour, 3) the Internet as a tool to study person-context interactions and specifically how it can be applied to studying the shyness-context interaction, and 4) future directions in using the Internet as a tool and intervention for the treatment of shyness. Portions of Chapter 2 were published in the *Internet Journal* (in press) and recently reprinted in the *International Journal of Psychology Research* (in press). In this chapter, all four of the goals were applied and explored.

Section 1 and 2 provide the foundation of the dissertation by presenting the current understanding of what is shyness, how it develops, and how it influences social communicative behaviour. Section 3 emphasizes the person-context interaction and how the Internet can be used as an effective tool to enhance the current understanding of shyness by allowing for greater manipulation of the context than in non-controlled settings. Finally, Section 4 focuses on how the information gained from using the Internet as a research tool can be extended to create novel intervention tools in the treatment of extreme shyness and other related constructs (e.g., social anxiety).

Are the effects of shyness on social communicative behaviour context specific? In Chapter 3, I present two empirical studies (Studies 1 and 2) from my research program. Both studies address how the personality trait of shyness interacts with

anonymity to influence social communicative behaviour. Study 1 was published in the *Journal of Research in Personality* (Brunet & Schmidt, 2007), and Study 2 was recently accepted for publication in *Cyberpsychology and Behavior* (Brunet & Schmidt, in press). Both papers focus on the person (i.e., shyness)-context interaction. Study 1 was conducted with a sample of undergraduate female students who were not selected for their shyness. In Study 2, I recruited a sample of undergraduate female students selected for individual differences in shyness (i.e., either high or low scores on shyness). The ideas and theory presented in the Introduction of the second paper extend those presented in the first paper. The general findings of the two studies are briefly reviewed in Section 3 of Chapter 2. Moreover, in both papers, I address the advantage of using the Internet to systematically control context with greater precision than face-to-face laboratory settings.

Are person by context interactions on computer-mediated social communication specific to shyness? In Chapter 4, I present two additional papers (Studies 3 and 4) that I have written and submitted for publication. In these two studies, I investigated if the effects of the person (i.e., shyness)-context (i.e., anonymity) interaction were specific to shyness or were they generalizable to other person-anonymity interactions. The specific purpose of these papers was to investigate additional person-context interactions that are related to other individual differences. In Study 3 (Brunet, Ma, & Schmidt, 2008, under review), I examined how self-esteem and loneliness separately interacted with context to influence social communicative behaviour. Self-esteem and loneliness are two constructs that have been linked to shyness, but are distinct constructs (Cheek & Buss, 1981; Dzwonkowska, 2002; Schmidt & Fox, 1995). In Study 4 (Brunet & Schmidt, 2008 under

review, *CyberPsychology & Behavior*), I investigated the person-context interaction by testing how context moderated the influence of another individual difference variable (i.e., sex) on social communicative behaviour.

The work presented in Chapter 4 contributes to my research goals in at least three ways. The first is that by investigating these person-context interactions, which are related to shyness, but not the same constructs, I demonstrated that the effects of the shyness-context interactions were specific to shyness, and were not generalizable to other individual differences variables. Additionally, these papers further support the importance of considering the person-context interaction when examining individual differences to explain behaviour. Finally, the research presented in Chapter 4 promotes the use of the Internet as an investigational tool not only to study shyness and context, but also to investigate a variety of person-context interactions.

Are person by context interactions on computer-mediated social communication specific to situation? In Chapter 5, I revisited the shyness-context interaction, but manipulated the context further to investigate if the effects of the shyness-anonymity interaction generalizable to other forms of social interaction. In the studies presented in Chapters 3 and 4, the participants were instructed to get to know one another in order to mimic a typical first meeting. In Study 5 presented in Chapter 5 (Brunet & Schmidt, submitted), I once again examined if anonymity moderated the influence of shyness on social communicative behaviour, but unlike the initial four studies, the participants were given a cooperative task to complete together. By doing so, I was able to demonstrate if other aspects of the context (e.g., different types of social interactions), can elicit

different patterns of social communicative behaviour in relation to the shyness-context interaction. Chapter 5 added to my research program by illustrating how different aspects of the context contribute to the person-context interaction. As well, more specifically, the findings reported in Study 5 in Chapter 5 highlight that shyness is particularly susceptible to changes in context related to social cooperation.

General Discussion. In Chapter 6, I present an integrative synthesis and interpretation of the meaning of the results from the five studies. Here, I also provide a discussion of implications, limitations, and future directions of the work

Chapter 2

Literature Review: The Phenomenon and Approach

Brunet, P.M., & Schmidt, L.A. (In press).   Internet and computer-mediated

technologies as new tools in the study of shyness: A review of recent survey- and

laboratory-based studies. *Internet Journal.*

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Internet and computer-mediated technologies as new tools in the study of shyness:

A review of recent survey- and laboratory-based studies

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Abstract

Internet and computer technologies allow for the investigation of traditional questions in personality and experimental social psychology regarding person-context interactions in new ways. In this paper, we review recent survey- and laboratory-based studies that have used the Internet and computer technologies to study shyness. We also discuss how these technologies can be used as laboratory tools to manipulate context in the study of shyness and social behaviour. We conclude with suggestions for future work using computer technologies in both basic and applied areas of research on shyness and social anxiety.

Introduction

Shyness is an anxious pre-occupation of the self in response to real or anticipation of social interaction. Over 90% of the population have episodes of shyness at some point in their lives (Zimbardo, 1977). These infrequent incidences are usually the result of a contextual cue such as another person, a setting, or an event. For example, an adolescent might feel shy on her first date, or a new employee might feel shy meeting the CEO of the company. Although these infrequent moments of discomfort during a social situation are temporary and may have no detrimental effects on the individual's well-being, this scenario is not true for every person. A subset of the population (10-15%) can be characterized as extremely shy or temperamentally shy (Kagan, 1994). For such individuals, shyness is an enduring personality trait which is stable both across time and across different domains of life (e.g., work place, dating, and school). It is important to note that despite the stability of shyness in some individuals, their shyness is influenced by context.

Recent advances in computer technologies such as the Internet allow for the investigation of old questions in personality and experimental social psychology regarding person-context interactions in new ways. In this paper, we review research that has led to our current understanding of shyness, and how that understanding can be enhanced using new technology such as the Internet and computer-mediated communication to address traditional questions related to person-context interactions. Although the extant literature has often used the term shyness interchangeably with social anxiety and social phobia, the work described herein is focused largely on shyness.

Where related constructs such as social anxiety and social phobia are used, this distinction is clearly noted.

The paper is divided among four parts. The first part describes the phenomenon of shyness, its developmental course and cognitive/affective, behavioral, and psychophysiological components. Part two focuses on the influence of shyness on studies involving traditional face-to-face (FTF) social communicative behavior. Part three addresses how today's technology (i.e., Internet) can be used as new tool to study old questions in personality and experimental social psychology in novel ways, and how the technology can be used to study shyness and context interactions on social communicative behaviour in particular. Part four provides suggestions for future directions in using the Internet as an intervention and treatment tool for extreme shyness, social anxiety, and social phobia.

The Phenomenon of Shyness

Origins and Developmental Course of Shyness. Adult personality traits are not assumed to have equivalent infant forms. Instead, infants are considered to exhibit temperaments, which are defined as their innate predisposition to specific behaviour patterns (Rothbart & Ahadi, 1994). Throughout development, experience shapes these individual temperaments to form adult personality traits (Rothbart & Ahadi, 1994). Shyness is not identified during infancy, but rather is the developmental outcome of a combination of infant temperament and experience.

Infancy. Over the last few decades, Kagan and his colleagues (1998) have used reactivity (e.g. limb activity and movement) as an early indicator of an infant's

temperament. One of the possible classifications is high reactivity. Infants labelled as high reactive move their limbs repeatedly and forcefully in response to novel stimuli. At 12 months, infants exhibit sufficient behaviour patterns to classify their level of inhibition instead of relying solely on their reactivity level. Behaviourally inhibited toddlers (a precursor of shyness) show signs of fear and avoidance to novel stimuli, people, and objects (Garcia Coll, Kagan, & Reznick, 1984). When faced with novel stimuli, inhibited toddlers try to avoid the stimuli by hiding behind their mothers (Fox, Henderson, Rubin, Calkins, & Schmidt, 2001). Behavioural inhibition is one of the commonly agreed upon possible temperaments that an individual may possess and that is predictive of shyness.

Childhood. Longitudinal studies have demonstrated that high reactive infants are more likely to be classified as behaviourally inhibited at 14 and 21 months of age (Kagan, Snidman, & Arcus, 1998). Other studies by Kagan (1989) have established that approximately 75% of toddlers classified as extremely behaviourally inhibited at 21 or 31 months of age were still exhibiting behavioural inhibition (e.g., did not initiate interactions with peers) at 7.5 years of age. Fox and colleagues have also shown that children classified as behaviourally inhibited at 14 months of age, as demonstrated by their avoidance of novel people (i.e., the experimenters) and of novel objects (i.e., new toys), are also labelled as behaviourally inhibited at 4 years of age (Fox et al., 2001). At the later age point, the inhibited children displayed reticent and on-looking behaviour during an observed free play session with three unfamiliar peers. There appears to be, for at least a subset of children, a developmental path from infancy to childhood for behavioural inhibition. In childhood, this behavioural inhibition takes on more

characteristics of adult shyness: behaviourally inhibited children are labelled as being shy children.

Adolescence and Adulthood. In Kagan's longitudinal study (Schwartz, Snidman, & Kagan, 1999), 13 year-old participants who had been previously classified as inhibited during the childhood visits to the laboratory did not spontaneously talk or smile at experimenters and unfamiliar peers during laboratory visits compared to their non-shy peers who did. These behaviours indicate that inhibited behaviour patterns continue into adolescence. Additionally, 61% of the children who had previously been identified as behaviourally inhibited were now experiencing social anxiety as adolescents (Schwartz et al., 1999).

Caspi and colleagues (Capsi, 2000; Capsi, Harrington, Milne, Amell, Theodore, & Moffitt, 2003) have also demonstrated a stable developmental pathway of shyness by tracking over a thousand individuals from 3 years to 26 years of age. Participants who were inhibited at the age of 3 years demonstrated avoidant behaviour (e.g., avoidance of risky behaviour and of leadership positions) when retested at the age of 18 and 26 years. These attributes are consistent with the non-assertive disposition of shy individuals.

Multiple Components of Shyness

Cognitive/Affective. Some three decades ago, it was established that individuals who were shy had specific cognitive thought patterns associated with situations that involve social interaction. For example, in role playing study designs, individuals high in social anxiety (e.g., shy individuals) expect to be evaluated by others more negatively and interpret feedback as being more negative than low socially anxious individuals (Smith &

Sarason, 1975). Shy individuals are overly concerned with how they appear to others in order to minimize the negative evaluation that they believe others will have of them. Therefore, they enter social situations with a heightened self-consciousness and self-preoccupation compared with non-shy individuals (Crozier, 1979).

Furthermore, Fatis (1983) asked 15 to 18 year olds who were shy, occasionally shy, and non-shy individuals to self-report their cognitive, behavioural, and physiological reactions to social situations. The cognitive reaction items included self-consciousness, thoughts about being evaluated, thoughts about how they are handling themselves, thoughts about the unpleasantness of the situation, and negative thoughts about themselves. The authors report that the shy group reported statistically significantly higher negative cognitions during social situations than the occasionally shy and non-shy participants.

Heightened self-consciousness and self-preoccupation have detrimental effects on behaviour and performance. On the Stroop colour and word test, shyness is related to poorer performance, increase in worrying about performance, and to test-irrelevant thinking (Arnold & Cheek, 1986). Heightened self-preoccupation caused by fear of being negatively evaluated appears to lead to shy individuals performing worse on the Stroop test.

Behavioural Components: Approach-Avoidance. Definitions of shyness usually include reference to some form of avoidant behaviour, from avoiding social situations and interactions all together (Pilkonis, 1977) to specific avoidant behaviour during interactions including gaze aversion (Cheek & Buss, 1981). Researchers have explored

the avoidance-approach motivations associated with shyness (Asendorpf, 1989, 1990; 1993; Schmidt, 1999; Schmidt & Fox, 1999). It has been postulated that differences in shyness can be explained by the approach-avoidance heuristic.

Asendorpf (1990) suggested two forms of shyness (i.e., social reticence and avoidance), both of which are high in avoidance tendencies, but differ in approach tendencies. Shy individuals who are high in approach tendencies are labelled as socially reticent, and those low in approach as avoidant. Schmidt and Fox (1999) have also adopted these distinctions, but refer to the socially reticent group as socially conflicted.

The dimensions of shyness and sociability as described by Cheek and Buss (1981) also reflect the approach-avoidance paradigm. Scores on the shyness scale reflect levels of avoidance behaviour, whereas scores on the sociability scale reflect approach behaviours (Cheek & Buss, 1981). These dimensions are conceptually distinct and empirically orthogonal. Based on their scores on the shyness and sociability measures, four groups were created; shy-sociable, shy-unsociable, unshy-sociable, and unshy-unsociable (Cheek & Buss, 1981). The shy-sociable individuals were high in both approach and avoidant behaviour and consequently are equivalent to Asendorpf (1990)'s social reticent group and Schmidt and Fox (1999)'s socially conflicted group; the shy-unsocial individuals would be classified as avoidant by other researchers (Asendorpf, 1990; Schmidt & Fox, 1999). Of the four groups, Cheek and Buss (1981) found that the high shy-high social individuals displayed more behavioural signs of anxiety. Avoidance tendencies help to define shyness, whereas approach tendencies explain differences within shyness.

Psychophysiological. In addition to cognitive and behaviour components, specific psychophysiological correlates have been associated with shyness (Fox et al., 2001; Fox, Rubin, Calkins, Marshall, Coplan, & Porgers, 1995; Kagan, Reznick, & Snidman, 1987; 1988, Schmidt, Fox, Rubin, & Sternberg, 1997; Schmidt, Fox, Schulkin, & Gold, 1999). Shy children and shy women exhibit greater relative right frontal EEG activation (a marker of stress) at rest (Fox et al., 1995; Schmidt, 1999). Schmidt and his colleagues (1999) noted increases in right, but not left, frontal brain activity and heart rate in temperamentally shy seven year-olds in response to an anticipated social presentation. Greater relative right frontal activity has been associated with negative affect and social withdrawal (Schmidt & Fox, 1999). Overall, given the early appearance of shyness and its stability of cognitive, behaviour, and psychophysiological patterns across development suggest that some shy individuals may be predisposed towards avoidance rather than approach-related behaviours that may influence their social interactions.

Shyness and Social Communicative Behaviour

Considering that shyness is defined by feelings of heightened self-consciousness and self-preoccupation in social settings (Crozier, 1979; Fatis, 1983), it is not surprising that over the last few decades much research has been dedicated to investigating the influence of shyness on social communicative behaviour. Through self-reported behaviour studies or experimentally designed observations of behaviour, we have a good understanding of how shy individuals behave socially in FTF settings.

One of the earliest studies in the area of shyness and FTF social communication was conducted by Pilkonis (1977) in which participants were observed in an opposite-sex

interaction, an interaction with the experimenter, and in the preparation and delivery of a speech. Pilkonis (1977) found that shy individuals, when interacting with an opposite-sex confederate, spoke less frequently, took longer to initiate a conversation, spoke for a smaller percentage of the time, and were less likely to break any lulls in conversation compared to their non-shy counterparts. However, despite making fewer utterances, the length of the shy and non-shy individuals' utterances was equivalent. Pilkonis (1977) concluded that shy individuals engage in reactive rather than initiative conversational styles. These differences were more apparent with males than females. Shy males made fewer glances, shorter percentage of time looking at the confederate, and less eye contact; on the other hand, shy females displayed more nodding and smiling than non-shy females or males in general. In the speech delivery setting, shyness was not related to poorer performance, despite the shy individuals reporting higher anxiety. This finding implies that shyness influences verbal behaviour in social settings, but not in speaking situations in general.

Thompson and Rapee (2002) reported similar findings by observing participants in an unstructured dyadic conversation (i.e., they were given no instructions to converse) and in a structured conversation (i.e., participants were instructed to get to know one another) with a confederate. Socially anxious differed from the non-socially anxious participants only in the unstructured conversation. Their overall molecular behaviour scores (e.g., conversation skills, voice quality) were worse compared to the non-socially anxious group in the unstructured conversation, but not in the structured conversations. Therefore, just as reported by Pilkonis (1977), being assigned a task seems to help shy

individuals with their speaking and conversational skills. Unfortunately, outside of a controlled laboratory setting, shy individuals will be faced with many more situations of unstructured than structured conversations.

Another study, which refuted and supported Pilkonis'(1977) findings, investigated the influence on shyness on mixed-sex dyads who were asked to get to know one another (Garcia, Stinson, Ickes, Bissonnette, & Briggs, 1991). Shyness was related to lower frequency and duration of the dyad's speaking turns (i.e., the combined score of both participants) and the number of questions asked during the conversation, but only for the male shyness. The lower frequency of turns matched Pilkonis' (1977) finding, but the shorter duration of turns did not. However, the difference may be due to type of measurement. Pilkonis (1977) used number of words per utterance as the measure, whereas it appears that Garcia and colleagues (1991) used the amount of time that utterances took. It is possible that shy males use the same number of words, but take less time to speak than other individuals. Male shyness was also related to non-verbal behaviour such as fewer smiles, less laughter, and fewer mutual gazes by the dyad. Interestingly, male shyness not only influenced their own behaviour, it also negatively influenced their partner's behaviour. Female shyness did not influence the actor's behaviours or the partner's behaviour.

Manning and Ray's (1993) dyadic study, in which participants conversed for 10 minutes, also supported Pilkonis' (1977) findings. Shy individuals do not seek speakership or attempt to end silences in conversation as frequently as non-shy individuals. Manning and Ray (1993) also observed that shy individuals spent more time

discussing the setting (i.e., the room in which they are in) and attempt to maintain a favoured topic (i.e., stick to one preferred topic). However, it is important to note that the authors did not present any statistical analyses to support their observations. In a survey study, Hill (1989) asked participants about the behaviours they exhibit in five different settings: when conversing with the opposite sex, when in class, when at a party, when in a checkout line, and when being introduced to a new person. Shy individuals reported initiating fewer conversations, asking fewer questions, and engaging in less small talk in all five settings. Interestingly, their reported opinions as to what constitutes appropriate behaviour matched the opinions given by non-shy participants, and matched the behaviour exhibited by non-shy individuals, but not their own. The implication is that shy individuals do recognize what is considered appropriate behaviour, but do not manage to exhibit that behaviour.

Research also demonstrated that shy individuals are less likely to self-disclose information about themselves during conversation. In a survey study, Matsushima, Shiomi, and Kuhlan (2000) found that participants' ($N = 433$) self-reported shyness was predictive of weaker social skills and self-disclosures. The influence of shyness on self-disclosure was moderated by social skills. Matsushima et al. (2000) suggested that increases in shyness were related to decreases in social skills and active interpersonal relationship skills, which then leads to less self-disclosure behaviour. Similarly, in a dyadic study, socially anxious participants paired with a confederate assigned to a high intimacy condition (i.e., confederate made highly personally disclosures) provided less intimate disclosures than non-socially anxious participants (Melesko & Alden, 1993).

However, in a low intimacy condition (i.e., confederate made superficial disclosures), socially anxious individuals provide more personal disclosures than their peers. Overall, both groups disclosed more intimately in the high intimate condition than in the low intimate condition. Taken together, the findings of the survey study (Matsushima et al., 2000) and of the dyadic study (Melesko & Alden, 1993) demonstrated that shy and socially anxious individuals disclose less information and less intimate information about themselves in most face-to-face situations.

The pattern of verbal communication in people who are shy also appears to generalize to written expression. By coding writing samples of 2406 undergraduate students, Pennebaker and King (1999) found that introversion (a construct related to shyness) was moderately related to a higher use of tentative words (e.g., perhaps), and exclusive words (e.g., without), negations (e.g., not), and related to lower use of inclusion words (e.g., with). Additionally, they found that introversion was statistically significantly related to a decrease in positive emotion word use (i.e., happy, beautiful) and to an increase in negative emotion word use (e.g., ugly, sadness).

The Use of the Internet and Computer Technologies as New Tools to Study Shyness:

Recent Survey- and Laboratory-Based Studies

Over the last two decades, the Internet has developed from a means for researchers to share information to a mainstream technological resource with numerous functions. The Internet is available in most work, school, and home settings in developed countries. Computer developers are always upgrading and updating the

associated features of the Internet to facilitate its users' ability to navigate the Internet to satisfy their needs. The increase of accessibility and user friendliness has led to the Internet becoming one of the leading social media available.

Through chat rooms, message boards, blogs, and instant messengers (e.g., Yahoo Messenger or Windows Live Messenger), Internet users have a quick and easy method of maintaining current relationships with friends and family and initiating new relationships with individuals located anywhere in the world. By becoming a member of a social network website (e.g., Facebook), individuals are able to upload pictures, share their interests, update their status (e.g., location, job, marital status), and send messages to friends. Consequently, the Internet has not only mimicked previous social media (e.g., the telephone), it has created opportunities for new types of socializing specific to itself, which have been embraced by its users.

Undoubtedly, this new social medium has piqued the interest of personality and health psychologists and professionals from various fields (e.g., business, communications, and sociology (see Taylor, 2002 for a Special Issue devoted to the topic). Two lines of research based on the Internet have been developed: the first to determine who and for what reasons the Internet is used with survey studies (Amichai-Hamburger, Wainapel, & Fox, 2002; Chak & Leung, 2004; Ebeling-Witte, Frank, & Lester, 2007; Hamburger & Ben-Artzi, 2000; Scealy, Phillips, & Stevenson, 2002; Stritzke, Nguyen, & Durkin, 2004; Ward & Tracey, 2004), and the second to use the Internet and computer technologies as investigative laboratory tools (Sheeks & Birchmeier, 2007) to manipulate contextual cues in order to expand traditional FTF

research (Brunet & Schmidt, 2007; Brunet & Schmidt, in press). Both lines of research can provide useful implications for the intervention and treatment of shyness and social anxiety. To date, the former line of research has been well-studied, although the latter is growing in popularity.

Shyness and Internet Use: Survey Studies

The Internet is hypothesized to be more appealing to shy and socially anxious individuals as a medium of social communication due to the anonymity (i.e., lack of face-to-face contact) associated with computer-mediated communication (CMC). Unlike FTF, body language, voice tone, attractiveness as well as other FTF issues are irrelevant online. Therefore, the anonymous online setting should lessen the heightened self-awareness and self-evaluative thoughts experienced by shy individuals during social interactions. It has been hypothesised that during online conversations, shy individuals will act more boldly than they typically do in FTF conversations (Roberts, Smith, & Pollock, 2000) and will use the Internet more frequently as a social medium than their non-shy peers in order to meet their relationship needs (McKenna & Bargh, 1999).

McKenna and colleagues (Bargh, McKenna, & Fitzsimons, 2002; McKenna, Green, & Gleason, 2002) demonstrated that socially anxious individuals are more comfortable presenting their 'real' me online and than their peers who do not require CMC to do so as they adequately present their 'real' me in FTF situations. The concept of 'real' me is adapted from the true self presented in Carl Roger's theory of personality. Rogers (1951) postulated that true self is who you are when you are free of perceived constraints imposed on you by others. McKenna and colleagues also reported that it is a

benefit for socially anxious individuals to be able to express their true self online (Bargh et al., 2002; McKenna et al., 2002). Further evidence supports that introverts are also better able to express their 'real' me online, whereas extraverts are better able to do so in traditional FTF settings (Amichai-Hamburger et al., 2002), and that extraversion in women is negatively related to using the Internet for social purposes (Hamburger & Ben-Artzi, 2000). These studies lend support to the idea that using the Internet as a social medium is more appealing to individuals who are shy so that they may express themselves, and less appealing to non-shy individuals, because they already express themselves well in FTF settings.

Others report that despite the frequency of shy individuals' Internet use for social communication, non-shy users are more at ease than shy users during online social interactions. Ward and Tracey (2004) conducted a self-report study with 414 participants. They asked the participants if they were currently or previously been involved in an online relationship (platonic or romantic) with someone they have never met in person. The participants who experienced an online relationship scored higher on shyness than did the individuals who had not. Shy individuals reported greater relationship involvement in their online friendships compared to their online friendship (e.g., more satisfaction with their online friendships than their offline friendships). However, shyness was still negatively correlated with relationship involvement measures, suggesting that non-shy individuals are more at ease with online relationships than shy individuals. Similarly, in a self-report study, a higher percentage of the high shy participants (73%) reported joining an Internet dating website to find a romantic or sexual

relationship compared to the low shy participants (46%) (Scharlott & Christ, 1995). Similarly to the 'real' me studies (Amichai-Hamburger et al., 2002; Bargh et al., 2002; McKenna et al., 2002), shy participants were more likely to report being able to explore their personality and fantasies online (Scharlott & Christ, 1995). However, the high shy individuals sent fewer messages to other people through the Internet dating website than the low shy group. The studies by Scharlott and Christ (1995) and Ward and Tracy (2004) both demonstrate that shy individuals do feel more comfortable communicating via the Internet than FTF interactions yet still exhibit some timid behaviour.

Despite using the Internet more than non-shy individuals, shy individuals use the Internet in a more hesitant manner than non-shy individuals. In a survey study of 134 university students, Stritze, Nguyen, and Durkin (2004) examined rejection sensitivity (i.e., the anxious expectation of rejection), initiation of relationships, self-disclosure, and emotional support in both offline and online settings. They found a context by shyness interaction on the first three measures, but not on emotional support. In offline settings, shy individuals and their non-shy peers reported statistically significantly different levels of rejection sensitivity, initiation of relationships, and self-disclosure. In online settings, shy participants reported the same levels on these measures as the non-shy participants. Both groups reported feeling less shy in online settings, but the difference was more dramatic for the shy group. Their online reported shyness was still higher than that of the non-shy group. This study supports the idea that shy individuals are more comfortable online than offline, but does not support the idea that non-shy individuals would be more comfortable offline.

In contrast to the studies reporting that shy individuals use the Internet more for social communication, others failed to find such personality patterns in Internet users. Peris and colleagues (2002) compared a group of undergraduate students to a group of participants recruited from the Internet. They found no differences between the groups for extraversion and psychoticism. They concluded that the Internet users did not exhibit any specific personality pattern. Instead, they are typical individuals who merely use the Internet as another social medium. In line with these findings, Scealy, Philips, and Stevenson (2002) found that shyness did not predict Internet use for communicative purposes (e.g., email and chat rooms) in a sample of 300 participants. Although the findings of the reviewed articles could be interpreted as contradictory, there is, however, an underlining pattern that can be found in all of these studies. Shy individuals (or introverted and socially anxious individuals) appear to act more boldly and be more comfortable engaging in social interactions online than to traditional FTF. Nonetheless, non-shy individuals also use the Internet for the same purposes. It appears that the Internet "levels" the playing field so that shy individuals can be just as (or at least closer to being as) outgoing as non-shy individuals allowing both groups to use the Internet as a social medium (Birnie & Horvath, 2007).

Shyness and Internet Use as an Experimental Tool: Laboratory Studies

There is a long and rich history of FTF research demonstrating the importance of the role of context. Bem and Allen (1974) postulated that some of the time people and their behaviour can be predicted by personality traits, whereas other times they are predicted by situational variables (i.e., context). Despite the importance of their findings,

they were based solely on self-reported behaviours, and reports from parents and friends. They did not objectively observe people in different situations.

Additionally, context was traditionally defined as differences in situations (e.g., school versus home setting). Today, context has been examined on more micro-levels than in the past, and context has begun to be divided into its elements and cues (e.g., sex of conversation partner). A recent study demonstrated that males disclose less emotional information to other men, whereas sex of conversation partner does not influence women's emotional self-disclosure (Burleson, Holmstrom, & Gilstrap, 2005). Using the Internet as a research tool, it is possible to systematically control additional contextual cues that cannot be controlled as easily in FTF settings (e.g., visual cues, identity of conversation partner's sex, turn taking). This second line of research involving the Internet is, albeit less common, more time and labour intensive, but nonetheless, an informative objective method to control a maximum number of contextual cues.

As noted earlier, studying the nature and frequency of Internet use can provide insightful findings about the influence of individual differences in personality on CMC behaviour. However, these studies were mostly reliant on self-reported behaviour. For example, in Stritze and colleagues' (2004) study, participants self-reported their amount of self-disclosure for online and offline settings. Their self-disclosure was not objectively measured. Using the Internet as a tool, researchers could extend these findings by examining the micro-elements of the context and manipulate them to address, for example, two related types of issues. One issue comprised differences in social communicative behaviour expressed in CMC settings and FTF settings (i.e., typing

versus talking). A second issue focuses on using the Internet's features (e.g., video and auditory broadcasting capabilities) to control more contextual cues than possible in FTF settings. The extra control afforded by the Internet as a tool is that it allows for more precise studies than tradition FTF studies.

Some researchers have begun to use the Internet as a research tool. Joinson (2001) conducted a series of studies utilizing the Internet to control visual cues to vary anonymity. In all three studies, he paired participants to form dyads. In Study 1, the dyads were randomly assigned to either a FTF condition or to a CMC condition and given a dilemma to discuss. In Study 2, Joinson (2001) controlled the level of visual anonymity by creating two CMC conditions. One condition (i.e., the visually anonymous condition) was exactly the same as the CMC condition from Study 1: participants discussed the dilemma via a chat program. Allowing the participant to see one another via a video conferencing system created the second CMC condition (i.e., the non-anonymous condition). In the final study, Joinson (2001) manipulated private versus public self-awareness by using the video-broadcasting feature of the chat program. To heighten private self-awareness, the video-feed was broadcasted on the participant's own computer screen, but not on the partner's monitor. Conversely, in the heightened public self-awareness, the participants were instructed that their conversation partner and the experimenter would be able to see them via the video broadcasting, but they could not see themselves on the monitor.

The series of studies allowed Joinson (2001) to systematically control levels of visual cues and to manipulate visual anonymity and self-awareness by using the Internet

as a research tool, which would have been difficult in traditional FTF laboratory conditions. Joinson's protocol could easily be replicated to address the effects of personality, in particular shyness, in combination with the effects of varying levels of visual anonymity have on social communicative behaviour.

To investigate individual difference characteristics such as sex differences, Postmes and Spears (2002) created quartets (2 males and 2 females) and used Internet and computer technologies as their controlled laboratory environment. The groups were assigned a dilemma to discuss via synchronous CMC (i.e., similar to a chat room). They found no sex differences for number of turns, number of words, number of questions, but found that men made more autonomous statements than women. For this specific study, gender was identifiable by the chat room name that each participant had (e.g. woman1, man2).

In another study examining gender differences and Internet/computer technologies, Thomson (2006) chose to keep gender unidentifiable by using a similar Internet set up. Quarters of 2 men and 2 women were given 4 topics to discuss (2 male stereotypical topics and 2 female stereotypical topics). The chat room names were not gender specific to avoid identifying the sex of each participant. Female participants disclosed more personal information, asked more questions, and referred to other participants' messages more than did the male participants. During female-stereotypical topics, participants used more female-preferential language (e.g., self-derogatory comments, and agreeing more with others). Similarly, for male-stereotypical topics, male-preferential language was used more (e.g., opinions and insults). These two studies

(Postmes & Spears, 2002; Thomson, 2006) demonstrate how similar studies may be designed, but with controlling one contextual cue depending on the goal of the experiment. By using the Internet, contextual cues (e.g., sex) can now be controlled by the experimenters. To date, there have been, however, few studies using the Internet as a tool to investigate how context moderates the influence of shyness on social communicative behaviour.

We recently conducted two studies to examine how visual anonymity moderates the influence of shyness on social communicative behaviour (Brunet & Schmidt, 2007; Brunet & Schmidt, in press). In these two studies, we paired participants (female undergraduate students) to form dyads who never met in person throughout the entirety of the experiment. Each participant was in an isolated testing room equipped with an Internet accessible laptop. We established two conditions differing only in visual anonymity, which were replications of Joinson's (2001) two CMC groups: the visually anonymous condition and the visual non-anonymous condition. To create these conditions, we used webcams. The participants in the visual non-anonymous condition could see and be seen by their partner via the webcams, whereas the participants in the visually anonymous condition were chatting without the benefit of seeing another via the webcams.

The protocol of the experiment was set up to mimic a natural online conversation. Participants were instructed to get to know one another by chatting via an instant messenger for 10 minutes to chat in the first study (Brunet & Schmidt, 2007), and 20 minutes in the second study (Brunet & Schmidt, in press). After the experiment,

participants completed personality questionnaires, including the Cheek and Buss Shyness and Sociability scales (Cheek & Buss, 1981).

In addition to the benefit of being able to control visually anonymity without changing any other aspect of the experiment, using instant messengers as a tool allowed for perfect transcription of the conversation. Instead of the labour and resource intensive task of transcribing FTF conversations verbatim, all of the messages exchanged between the participants were recorded and saved automatically. The ultimate goal of the studies was to extend the FTF literature on the influence of shyness on social communicative behaviour. Therefore, our hypotheses were guided by the findings described in the *Shyness and Social Communicative Behaviours in FTF settings* section of this review paper.

In Study 1, we coded for three categories of measures: conversational style measures (e.g., self-disclosures), traditional linguistic measures (e.g., number of words per turn), and Internet-specific measures (e.g., emoticons) (Brunet & Schmidt, 2007). We found that shyness was negatively related to the number of self-disclosures made by participants in the visually non-anonymous condition, but no such relation was found in the visually anonymous condition.

In Study 2, we also examined a fourth set of measures namely use of affective language measures (e.g., proportion of active words) (Brunet & Schmidt, in press). Except for the Internet-specific measures, all of the measures were coded in FTF transcripts as well. We selected extremely high shy participants and paired them with selected extremely low shy participants. In line with our findings from Study 1, the

high shy participants statistically significantly disclosed less personal information in the visually non-anonymous condition than the low shy participants, but no differences were found in the visually anonymous condition. Therefore, we were able to objectively measure self-disclosure while controlling visual anonymity. By doing so, we contributed to two areas of shyness research. The first is that we provided evidence supporting the hypothesis that shy individuals act more boldly online, but only when visual anonymity is maintained. We also contributed to the FTF research on shyness, by demonstrating that the effects of shyness on self-disclosure, as previously reported (Matsushima et al., 2000; Meleshko & Alden, 1993), are influenced by contextual cues such as visual anonymity. This result could imply that the self-consciousness and self-preoccupation that shy individuals experience during social interactions is not due to interaction itself, but instead to the exchange of visual cues.

Our findings also demonstrated that the effects of shyness on some forms of behaviour remain consistent despite differences in visual anonymity. For example, in our second study, shy individuals initiated fewer topics throughout the conversation than did the low shy participants regardless of condition. Likewise, their use of affective language remained the same regardless of condition (e.g., shy individuals used less fun words than their low shy partners).

Future Directions and Implications

Our study design was only one of the many possible experimental designs for using the Internet as a research tool to study shyness, social anxiety, and social phobia

(Brunet & Schmidt, 2007; Brunet & Schmidt, in press). For example, researchers could modify our design to replicate Joinson's (2001) third study. Currently, we replicated the conditions Joinson (2001) established in his second study (i.e., visually anonymous versus visually non-anonymous). Researchers could manipulate the private versus public self-awareness levels of the conversations by having a condition in which the participants could see themselves via the webcam. With our current design, the participants could only see their partner. Considering that shy individuals have heightened self-consciousness and self-preoccupation (Crozier, 1979; Fatis, 1983), it seems plausible to predict that a condition high in both private and public self-awareness would result in high behavioural inhibition of shy individuals, and that a condition low in both (i.e., the visual anonymous condition) would allow shy individuals to be bolder.

With additional control of contextual cues by using the Internet as a laboratory tool, we can more reliably pinpoint exactly how shyness and other personality traits influence behaviour, especially social communicative behaviour than in FTF situations. With a firmer grasp of how shy individuals' heightened self-perception and avoidance behaviours are elicited, research can be directed to developing effective intervention and treatment options to help overcome the effects of shyness, social anxiety, and social phobia. The Internet could then be used not only as an experimental tool, but also as an intervention tool.

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Chapter 3

Are the effects of shyness on social communicative behaviour context specific?:

Evidence from unselected and selected samples

Studies 1 and 2

<u>Study 1</u>:

Brunet, P.M., & Schmidt, L.A. (2007). Is shyness context specific? Relation between shyness and online self-disclosure with and without a live webcam in young adults. *Journal of Research in Personality*, *41*, 938-945.

Is shyness context specific? Relation between shyness and online self-disclosure with and without a live webcam in young adults

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Abstract

The Internet provides a new tool to investigate old questions in experimental social psychology regarding Person × Context interaction. We examined the interaction of self-reported shyness and context on computer-mediated communication measures. Sixty female undergraduates unfamiliar were paired in dyads and engaged in a 10 min free chat conversation on the Internet with and without a live webcam. Free chat conversations were archived, transcripts were objectively coded for communication variables, and a linear mixed model used for data analysis of dyadic interaction was performed on each communication measure. As predicted, increases in self-reported shyness were statistically significantly related to decreases in the number of prompted self-disclosures (after controlling for the number of opportunities to self-disclose) only in the webcam condition. Self-reported shyness was not related to the number of prompted self-disclosures in the no webcam condition, suggesting that shyness was context dependent. The present study appears to be the first to objectively code measures of Internet behaviour in relation to the study of personality in general and shyness in particular. Theoretical and clinical implications for understanding the contextual nature of shyness are discussed.

Introduction

With the advent of the Internet as a method of communication, personality and experimental social psychology researchers have begun to use this technology as a tool to investigate psychological processes and social behaviour (Bargh & McKeena, 2004; Bargh et al., 2002; McKenna & Bargh, 1998; McKenna and Bargh, 2000; McKenna et al., 2002). The use of computer and Internet technologies is particularly relevant to the study of shyness because it allows for experimental manipulation of the social context in novel ways. Traditionally, social context has been limited to face-to-face settings. With the use of Internet technologies as a psychological laboratory (Skitka & Sargis, 2006), more detailed manipulations can be made to control visual and auditory cue exchanges. For example, we can decompose social interaction to its most basic component (i.e., the exchange of information) and incorporate as many or as few of the other components (i.e., visual and auditory cues) as needed.

One definition of shyness is that it is an anxious preoccupation of the self in response to real or imagined social interaction and is associated with heightened self-consciousness during self-presentation and evaluation situations (Melchoir & Cheek, 1990). The heightened self-consciousness in social situations or anticipation of such situations may disrupt goal directed behaviour (i.e., positive self-presentation and regard; Carver & Scheier, 1986). Behaviourally, this heightened self-consciousness may inhibit self-disclosure and verbal communication in people who are shy (Meleshko & Alden, 1993). As computer-mediated communication is primarily text-based, most people do not see or hear one another when communicating via this medium. Accordingly, the verbal

and non-verbal cues that are particularly salient to shy individuals in face-to-face interactions are not present (Jones, Cheek, & Briggs, 1986). The anonymity created by lack of cues such as hearing or seeing one another has been hypothesized as allowing shy individuals to be more comfortable participating in online social interaction and disclosing more online than in face-to-face interactions (Roberts, Smith, & Pollock, 2000).

Although a number of recent studies have examined relations between shyness (and related constructs such as introversion) and Internet use (Amichai-Hamburger et al., 2002; Chak & Leung, 2004; Hamburger & Ben-Artzi, 2000; Scealy et al., 2002, Stritzke et al., 2004; Ward & Tracey, 2004), these recent studies used only subjective measures (self-report and anecdotal accounts) to index Internet behaviour. To our knowledge, there are no studies that have used objective behavioural measures of Internet communication in relation to personality in general and shyness in particular. Accordingly, we used computer and Internet technologies as a tool to understand whether the interaction of shyness and context influenced objective measures of computer-mediated social communicative behaviour.

Sixty female undergraduates unfamiliar who were paired in dyads engaged in a 10 min free chat conversation on the Internet with or without a live webcam. All free chat conversations were archived, and the transcripts were objectively coded for communication variables (e.g., total number of words, mean word count per turn, questions, and self-disclosure). Of particular interest was the computer-mediated measure of self-disclosure prompted by the dyad partner and the spontaneous self-disclosures

because of the research linking shyness to difficulties with self-disclosure (e.g., Meleshko & Alden, 1993).

We predicted a statistically significant interaction between shyness and context (i.e., webcam, no webcam) on computer-mediated self-disclosure. We hypothesized, given that the exchange of visual cues broadcasted over the webcam would be perceived as an evaluation situation, increases in self-reported shyness would be related to decreases in both the number of self-disclosures when prompted by their dyad partner during free chat (after controlling for the number of opportunities to self-disclose) and the number of spontaneous self-disclosures only in the webcam condition. We also predicted, given that the visual cues from the webcam would not be present during the no webcam condition, self-reported shyness would not be related to the number of prompted self-disclosures or the number of spontaneous self-disclosures in the no webcam condition.

Method

Participants

Sixty women who ranged in age from 17 to 23 years (M = 19.23 years, SD = 1.44 years) were recruited from undergraduate classes at McMaster University. Because a limited number of male participants volunteered (n = 14) for the study, their data were not included in the analyses. All participants received undergraduate course credit for their participation.

Apparatus

Each participant used one isolated testing room. The rooms were equipped each with an Internet accessible PC and a Creative NX Pro webcam. The webcams were

centered and attached to the top of the computer monitors during the webcam condition, and they were not present during the no webcam condition. The image size broadcasted by the webcams was 320×240 pixels, thereby projecting the entire head and face of each participant. Yahoo! Messenger was chosen as the instant messenger due to its message archive option. By activating the archive, all conversations were automatically saved.

Procedure

All participants were tested in the Child Emotion Laboratory in the Department of Psychology, Neuroscience and Behaviour at McMaster University. Participants were scheduled to arrive 10 min apart in different locations to avoid meeting one another prior to the start of the experiment. Upon their arrival, they signed consent forms and were given instructions about the experiment. All procedures were approved by the McMaster Research Ethics Board.

These women were then paired to form 30 dyads. Each dyad was randomly assigned to either a webcam condition (15 dyads) or a no webcam condition (15 dyads). For participants in the webcam condition, the lens was blocked until the conversation started so that they did not see one another before the experiment began. Also, only visual images of the participants were presented continuously via the webcams during the entire dyadic interaction; there were no auditory communication cues presented. The participants took part in a 10 min free chat conversation with their partner, with the instructions given to chat with their partner to get to know one another about any topic of their choosing. The only restriction was no insults. The experimenter, who was not present during the freechat, terminated the conversation once the time limit was up.

Following the free chat conversation, the participants completed an Internet

Activity Questionnaire asking them about their Internet habits (e.g., hours spent using

instant messengers and number of friends on buddylist). They also completed the 5-

highest loaded items (see Bruch, Gorsky, Collins, & Berger, 1989) from the Cheek and

Buss Shyness Scale (Cheek, 1983; Cheek & Buss, 1981), which is widely-used in adult

personality research to index shyness. Sample items include: "I find it hard to talk to

strangers" and "I feel inhibited in social situations". Each item was rated on a 0

(extremely uncharacteristic) to 4 (extremely characteristic) metric. Reliability and

validity data for this scale are excellent (Bruch et al., 1989, Cheek & Buss, 1981). All

participants were well-versed in Internet usage, and shyness was not systematically

related to the amount of time spent on the Internet or lack of familiarity with the Internet.

Computer-mediated communication coding and measures

Three research assistants (RAs) who were trained on computer-mediated

communicative behaviour coding and who were blind to the purpose and hypotheses of

the study coded the transcripts derived from the free chat conversation. Two RAs coded

each variable, and a third RA resolved any discrepancy between the coders. Reliability

among coders ranged from .66 to .94 on the following variables coded:

Total word count was calculated for each participant. The number of words that

each participant typed during the 10 min was summed to calculate her total word score.

Internet abbreviations, e.g., "lol" (laugh out loud) and "omg" (oh my god), were counted

as one word instead of three. *Total number of turns* was coded as the sum of the number

of turns taken by each participant. Each message sent by a participant was counted as one

turn. *Mean word count per turn* was calculated based on the total word count and the total number of turns. The total word count divided by the total number of turns yields the mean word count per turn for each participant. *Double turns* counted every time one partner took a turn immediately following her last turn without giving her partner a chance to reply. If one partner entered three messages before her partner entered one, it was counted as two double turns. *Original questions* represented the first appearance of a question during the conversation, such as "What's your name?" asked by one participant to the other. A *reply question* was any question that echoed a previously asked question, such as replying to the first question with, "I'm Erin, what's yours?" asked by the second participant. The question did not have to be verbatim. It needed only to request the same information as another question.

The transcripts were coded for the number of disclosures that included personal information during the free chat conversation. The disclosures were classified as *prompted self-disclosures* or *spontaneous self-disclosures*. To qualify as prompted, the disclosure needed to be elicited by the other participant asking a question or by giving the same information first. A spontaneous self-disclosure occurred when a participant volunteered personal information about herself without that information being first requested by the partner (Joinson, 2001).

Coders also indicated each time a new topic was introduced into the conversation. Participants were credited for the number of topics that they introduced during the free chat. The total number of topics that each introduced was her *topics started* score. Occasionally, participants would take a turn to correct a typo made in a previous turn. A

score for the number of *corrections* made was calculated for each participant. The free

chat transcripts were also coded for the number of *first person pronouns* and *second*

person pronouns used. Finally, the transcripts were coded for English and net lingo (e.g.,

"brb" for be right back), and emotions (e.g., smiling face; see Jansen, 2005, for an

exhaustive list).

Results

Given that each member of the dyad provided data that were not independent (i.e.,

they influence each other), we performed a linear mixed model. This method of analysis

is routinely used for dyadic studies to account for non-independence and is reported

elsewhere (Cook & Kenny, 2005; Kenny, 2004; Little & Card, 2005). For each variable,

a linear mixed model was performed with dyads as the subject and member as the

repeated variable. Webcam condition was entered as a factor, and actor's shyness as well

as partner's shyness were entered as covariates. This model was used to examine

separately each of the dependent measures coded from the transcripts.

As predicted, the analysis revealed a statistically significant Actor's

Shyness × Condition interaction only on the prompted self-disclosure measure [$F(1,$

$53.11) = 4.08, p = .048$], but it did not reveal any statistically significant main effects or

interaction for the number of spontaneous self-disclosures. As the participants' self-

reported shyness increased, the number of prompted self-disclosures decreased only in

the webcam condition [$\beta = -.36, r = -.57, p = .001$]. Participants' self-reported shyness

in the no webcam condition was not related to the number of prompted self-disclosures

[$\beta = -.06, r = -.08, p = .67$] (see Figure 3.1). Importantly, shyness was not related to the

total number of opportunities to self-disclose ($p > .05$), as measured by the combined number of questions that they were asked and the number of spontaneous self-disclosures made by their partner.

The analysis also revealed a statistically significant main effect of Actor's Shyness on first person pronouns used [F (1, 54.29) = 7.26, p = .009]. As self-reported shyness increased, the number of first person pronouns used decreased [ß = −.37, r = −.31, p = .016], regardless of webcam condition. (Note that two outliers were eliminated from the analysis involving first person pronouns. The findings were statistically significant with or without the outliers.)

There were no other statistically significant main or interaction effects on any of the computer-mediated communication behavioural measures coded from the transcripts.

Discussion

Is shyness context specific? We found that particular contexts (i.e., presence or absence of visual cues from a webcam) influenced certain types of social computer-mediated communicative behaviour (e.g., personal self-disclosure), but not other aspects of online communication (e.g., the amount of conversation) in relation to self-reported shyness. As self-reported shyness increased, prompted self-disclosure decreased only when a live webcam was present. The relation between self-reported shyness and the number of prompted self-disclosures was not statistically significant in the no webcam condition, suggesting that shyness may be problematic only in some contexts. These findings are consistent with literature suggesting that evaluative cues (e.g., being seen or heard) are particularly difficult for shy individuals (see Crozier & Alden, 2005, for a

review). These cues produce anxiety and inhibit a shy individual's ability to engage in personal self-disclosure (Meleshko & Alden, 1993), which is critical for maintaining and sustaining social relationships. Interestingly, the findings were specific to the prompted self-disclosure measure in the webcam condition.

Although increases in shyness were also related to decreases in the use of first person pronouns, there were no statistically significant relations between self-reported shyness and the total number of words used or mean word count per turn. This result is consistent with other studies demonstrating that shy individuals do not use fewer words or have poorer language skills than non-shy individuals (Spere et al., 2004; Van Kleeck & Street, 1982), but rather there are specific aspects of communication (i.e., self-disclosure) that are affected in shyness.

For dyadic laboratory studies, Internet conversation may be more advantageous than traditional face-to-face conversation because several variables can be controlled. For example, because participants on the Internet are typing their conversation, the speed of conversation can be controlled more easily. A benefit of dyadic studies using Internet webcams is being able to tease apart the medium from the anonymity provided by the medium. If there had been only a main effect for the webcam condition, it would have supported the idea that increased anonymity was the reason that individuals (shy or not shy) behaved more boldly online. The statistically significant interaction between shyness and webcam condition on prompted self-disclosures indicates that, for at least one type of communication variable, anonymity is important for individuals who self-reported high shyness.

Another benefit of using the Internet for interpersonal communication via instant messengers is that it may help shy individuals develop assertiveness in a less threatening and evaluative setting. Clinicians could develop interventions and treatment plans that incorporate the Internet (e.g., Tate & Zabinski, 2004) and allow for gradual exposure to increasing evaluative cues by manipulating the contextual conditions and the composition of the dyad. For example, a possible hierarchy of exposure might be: no webcam, microphone voice only cue; webcam face only cue; webcam face-voice cues and same sex dyad partner; webcam face-voice cues and opposite sex dyad partner; webcam face-voice cues and attractive dyad partner; webcam face-voice cues and aggressive dyad partner, etc. Social communicative skills could then be generalized to face-to-face interactions in shy individuals.

The present study appears to be the first to use objectively coded measures of Internet behaviour in relation to the study of personality in general and shyness in particular. Using computer Internet technologies as a tool to manipulate social context in new ways, the present findings underscore the importance of contextual influences on shyness and social behaviour (see also Fox et al., 2005; Schmidt et al., 2005; Scott, 2004). Because shy adults differ in social communication only in certain contexts, future studies may wish to incorporate various experimental manipulations of the social context using a larger sample than used in the present study, include both males and females, and mix the composition of the dyad (e.g., attractive female and shy male) in order to isolate those contexts and/or aspects of social contexts that are potentially problematic. Computer-mediated communication studies using clinical populations (such as those

diagnosed with social phobia) and non-clinical participants who are selected for extreme

shyness might also advance our understanding of Person × Context interactions in

individuals whose clinical category or personality is defined in part by problems with

social communication.

Acknowledgments

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Figure Captions

Figure 3.1 Scatterplot of the relation between self-reported shyness and number of computer-mediated prompted self-disclosures (after controlling for the total number of opportunities to self-disclose) with ($n = 30*$) and without ($n = 30*$) the presence of a live webcam. (*Note*. Discrepancies in total cases presented on the scatterplot reflect the direct overlay of some cases).

Figure 3.1
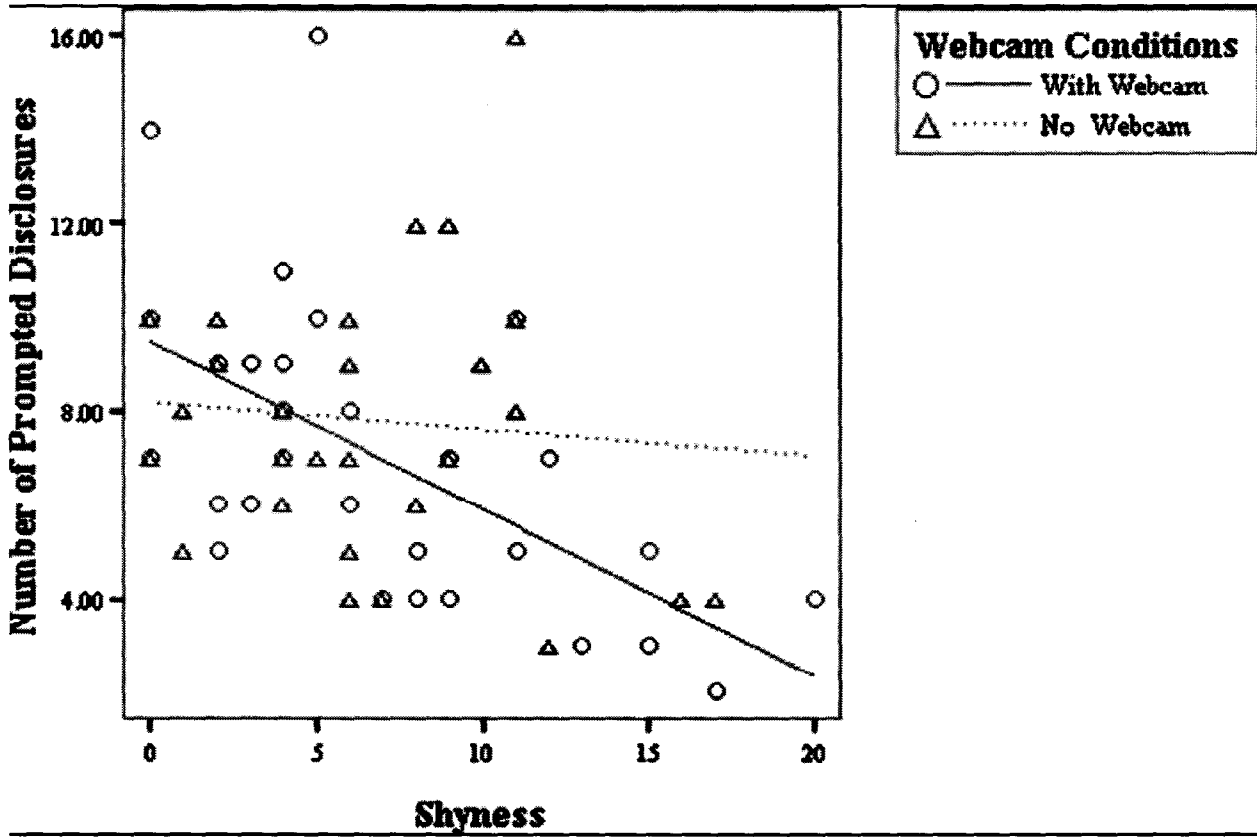
<u>**Study 2**</u>:

Brunet, P.M., & Schmidt, L.A. (In press). Are shy adults "really" bolder online? It depends on the context. *CyberPsychology & Behavior*.

Are shy adults "really" bolder online? It depends on the context

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Abstract

We examined whether individual differences in shyness and context influenced the amount of computer-mediated self-disclosure and use of affective language during an unfamiliar dyadic social interaction. Unfamiliar young adults were selected for high and low self-reported shyness and paired in mixed dyads (one shy and one non-shy). Each dyad was randomly assigned to either a live webcam or no webcam condition. Participants then engaged in a 20-min online free chat over the Internet in the laboratory. Free chat conversations were archived, and the transcripts were objectively coded for traditional communication variables, conversational style, and the use of affective language. As predicted, shy adults engaged in statistically significantly fewer spontaneous self-disclosures than their non-shy counterparts only in the webcam condition. Shy versus non-shy adults did not differ on spontaneous self-disclosures in the no webcam condition. However, context did not influence the use of computer-mediated affective language. Although shy adults used statistically significantly less active and pleasant words than their non-shy counterparts, these differences were not related to webcam condition. The present preliminary findings replicate and extend earlier work on shyness, context, and computer-mediated communication to a selected sample of shy adults. Findings suggest that context may influence some, but not all, aspects of social communication in shy adults.

Are shy adults "really" bolder online? It depends on the context

Although shyness is a ubiquitous phenomena that over 90% of adults report

experiencing at some point in their lives (Zimbardo, 1977), a smaller percentage of

healthy individuals (approximately 10-15%) are characterized by dispositional shyness

(e.g., Kagan, 1994). Dispositional shyness is an early developing personality style that

appears to be modestly stable during the preschool and early school age years (Kagan,

1994) and into adulthood (Beidel & Turner, 1998) and is associated with distinct patterns

of psychophysiological responses at rest and during social stress (see Schmidt, Polak, &

Spooner, 2005, for a review). Key characteristics of dispositional shyness include an

anxious preoccupation of the self in response to real or imagined social interactions, and

a heightened self-awareness during self-presentation and evaluation situations, leading to

inhibition of behavior (see Melchoir & Cheek, 1990, for a review).

Social communication is one aspect of behavior that is consistently affected in

shyness. Shy individuals' utterances are reactive instead of initiative, they take more

time before speaking their first utterance, speak for a lower percentage of the

conversation, and are less likely to break any lull in conversation compared to their non-

shy peers (Pilkonis, 1977). However, some aspects of language appear to be the same in

shy and non-shy individuals. For example, the length of utterances is similar in shy and

non-shy individuals, despite shy individuals making fewer utterances (Pilkonis, 1977).

Shyness, as well as other forms of social anxiety, also affects other aspects of

social communication. Melesko and Alden (1993) noted that shy individuals make fewer

self-disclosures than non-shy individuals during social interactions. Matsushima and

Shiomi (2000) found a negative relation between shyness and self-disclosure, and the relation was moerated by social skills. Shy individuals who had lower levels of self-reported social skills made fewer self-disclosures during social interactions than those with good social skills.

Some researchers have suggested that the heightened self-consciousness and anxiety experienced by shy individuals are most likely lessened in situations in which anonymity is presumed to exist such as over the Internet (Roberts, Smith, & Pollock, 2000), thereby no longer interfering with their verbal communication and self-disclosure. However, there have been relatively few empirical studies that have manipulated anonymity in the study of shyness largely because there are design limits to studies using traditional face-to-face interactions. For example, it is difficult to manipulate and control contextual cues to create settings that vary in anonymity and difficult to control the nature of the conversation and turn taking (reciprocity) in the conversation during face-to-face interactions.

Today, the Internet provides researchers with a tool to investigate traditional questions in personality and social psychology regarding Person X Context interactions on social behavior in new ways in a controlled laboratory setting. Internet technology has been used in a variety of ways over the last decade to study social behavior (Bargh & McKenna, 2004; McKenna & Bargh, 2000; see also Taylor, 2002 for a Special Issue devoted to the topic). This technology allows researchers to reduce social interaction to its basic components (i.e., exchange of information) and include other components (i.e., visual and auditory cues) as needed. In the home setting, individuals already interact in

this way by chatting via instant messengers and chat rooms. Individuals have the choice to include visual cues by using a webcam and auditory cues by using a microphone. By recreating these chat settings in the laboratory, researchers can control the level of anonymity experienced. In a series of studies, Joinson (2001) used the Internet to form settings that varied in visual anonymity. He demonstrated that greater self-disclosure occurred in settings with greater visual anonymity. However, Joinson did not examine the influence of individual differences in personality on computer-mediated communication measures.

We recently paired 60 unfamiliar undergraduate female students who were not selected for shyness into 30 dyads (Brunet & Schmidt, 2007). We then randomly assigned dyads to either a webcam or no webcam condition. Participants engaged in a 10-min conversation via an instant messenger. In the webcam condition, the participants could see one another, but those in the no webcam condition could not. The free chats were objectively coded for traditional communication variables. We found that the level of shyness and context (i.e., webcam condition) interacted. Increases in shyness were related to decreases in prompted self-disclosures only in the webcam condition after controlling for the number of opportunities to self-disclose. There was no relation between shyness and the number of prompted self-disclosures in the no webcam condition. Participants reporting high and low self-reported shyness behaved the same in the no webcam condition on number of prompted self-disclosures —a measure that has been linked to self-presentation anxiety.

The purpose of the present study was two-fold. First, we attempted to extend our recent findings (Brunet & Schmidt, 2007) to an extreme group design. An extreme group design allowed us to explore the extent to which individual differences in shyness and context interacted to influence traditional social communication measures. In our previous study (Brunet & Schmidt, 2007), the pairing of participants was random. In the current study, we examined shyness and context interactions on computer-mediated communication in mixed dyads, pairing high and low shy participants. By controlling the dyadic composition, we can more confidently interpret the results as an effect of visual anonymity and not as an effect of variability in the shyness of the conversation partner. With the current extreme group design, all of the high shy participants faced the same social challenge of interacting with an extremely low shy partner. We also increased the amount of time devoted to free chat from 10 to 20 min. The increase in free chat time allowed us to derive a more reliable measure of social communication by having more opportunities and longer amounts of time to examine than available in our initial study.

A second goal of the present study was to examine other aspects of computer-mediated social communication in order to examine the specificity of context on different domains of social communication in shyness. In addition to traditional communication and conversational style measures coded from the online conversation, we examined the use of affective language. Previous research has provided examples of how personality can influence the use of language. In oral communication, extraverts use more implicit language words (e.g., pronouns, adverbs, and verbs) and introverts use more explicit language words (e.g., nouns, modifiers and prepositions; Dewaele & Furnham, 2000).

These authors suggested that introverts, to avoid being misunderstood, use more explicit language since introverts are anxious about how there are perceived by others. However, in written communication (e.g., email), differences of implicit and explicit language were not found between extraverts and introverts (Oberlander & Gill, 2004). Instead, the differences were found between high and low neurotics. Oberlander and Gill (2004) suggested that the communication medium (i.e., oral versus written) could explain the discrepancy in findings between introverts and extroverts. However, it might not be limited to the nature of the medium, but instead to varying levels of anonymity created by each medium.

In addition to how personality influences language, another line of research has focused on how affective state or mood influence language. Forgas and colleagues (2007) used audio stimuli to induce either a positive or negative mood in their participants. During an online conversation task, participants in the negative mood group used more negative words and were less persuasive in their arguments. Participants in the positive mood group used more positive words and were more persuasive. Taken together, research has demonstrated links among personality, mood, and language choice. However, the influence of personality on affective language in general, and the interaction of personality and context on the use of affective language in particular, have yet to be fully explored.

We also examined the influence of context on the use of computer-mediated affective language in shy adults during the dyadic social interaction. We compared the proportion of words used by the study participants with established normative data for

words rated on two dimensions: activation and pleasantness. Based on these two dimensions eight affective categories were formed: pleasant, unpleasant, active, passive, fun, nasty, nice, and sad (see Whissell, 1999).

We selected from a sample of 520 female undergraduates, young adults who were high and low on trait shyness. We then paired them in mixed dyads (one high shy and one low shy). Each dyad was randomly assigned to either a webcam or no webcam condition and participants engaged in a 20 min free chat over the Internet in the laboratory. The free chat was objectively coded for a number of language measures.

We predicted a statistically significant interaction between shy group (high, low) and context (webcam, no webcam) on computer-mediated social communication measures. Shy participants would make less spontaneous and prompted self-disclosures and use more passive and sad words and less active and fun words than the non-shy participants, but only in the webcam condition. In the no webcam condition, shy and non-shy participants would not be distinguishable on these computer-mediated social communication measures.

Method

Participants

Participants were 520 female undergraduate students who ranged in age from 17 to 38 ($M = 20.70$ years, $SD = 2.40$ years). Participants were recruited from the McMaster University's student centre on two separate days. Each participant completed a series of personality measures in exchange for $5 remuneration as part of a larger study on personality and social behavior. One of the personality measures was the 13-item Cheek

and Buss Shyness Scale (Cheek, 1983; Cheek & Buss, 1981), which is widely used in adult personality research to index trait shyness. Sample items include: "I find it hard to talk to strangers" and "I feel inhibited in social situations". Each item was rated on a 0 (extremely uncharacteristic) to 4 (extremely characteristic) metric. Reliability and validity data for this scale are excellent (Bruch, Gorsky, Collins, & Berger, 1989; Cheek & Buss, 1981).

Participant selection. From the larger sample of 520, 28 female participants (M = 21.43 years, SD = 1.76 years, range 18 to 24 years) who fell +/- 1 SD above (total score cutoff of 29) or below (total score cutoff of 7) the mean on the Cheek and Buss Shyness Scale were selected: 14 high shy and 14 low shy. All selected participants were either called or emailed to participate in the laboratory phase of the study. All selected participants reported past experience with online chat in English over the Internet and received $10 remuneration for their laboratory participation.

Apparatus

Two isolated testing rooms, one for each member of the dyad, were equipped with an Internet accessible laptop and a Creative NX Pro webcam. The webcams were centered and attached to the top of the laptop during the webcam condition, and they were not present for the no webcam condition. The image size broadcasted by the webcams was 320 X 240 pixels, thereby projecting the entire head and face of each participant. Yahoo! Messenger was selected as the instant messenger for its message archive feature. By activating the archive, all conversations were automatically saved.

Procedure

All selected participants were tested in the Child Emotion Laboratory in the Department of Psychology, Neuroscience & Behaviour at McMaster University. Participants were scheduled to arrive 5 min apart to avoid meeting one another prior to the start of the experiment. Upon their arrival, participants were ushered to separate rooms where they signed consent forms and were given instructions about the experiment. All procedures were approved by the McMaster Research Ethics Board.

Each dyad comprised one high shy and one low shy participant. An equal number of dyads were randomly assigned to either a webcam condition or a no webcam condition. To ensure that participants in the webcam condition did not see one another before the experiment started, the lens of the webcam was blocked. The experimenters removed the page blocking the lens when the conversation started. The participants in the webcam condition were able to see, but not hear, one another. Participants in the no webcam condition could neither see nor hear one another.

The participants engaged in a 20-min free chat conversation with their partner. They were instructed to get to know one another by chatting about topics of their choosing. The only restriction was to avoid insulting one another. The experimenter terminated the conversation once the time limit was up.

Following the free chat conversation, the participants completed an Internet Activity Questionnaire asking them about their Internet habits (e.g., hours spent using instant messengers and number of friends on buddylist). All participants were well-

versed in Internet usage, and shyness was not systematically related to the amount of time spent on the Internet or lack of familiarity with the Internet.

Participants also completed Cheek and Buss Shyness Scale (Cheek & Buss, 1981) again in order to ensure stability of shyness from the initial screening to laboratory testing. Participants' shyness scores from the initial recruitment phase were highly correlated with their shyness scores obtained at the time of laboratory testing [$r = .93$, $p < .0005$]. This relation was not surprising given the extreme group design, so we also examined their total shyness scores indexed at the laboratory to ensure that the participants' shyness scores remained above or below the cut-off values used at the time of their screening, which they did.

Computer-Mediated Communication Coding and Measures

We coded the transcripts for four types of measures: conversation style, traditional linguistic, Internet-specific communication, and use of affect in language.

Conversation Style Measures. Two research assistants (RAs) who were trained on computer-mediated communicative behavior coding and who were blind to the purpose and hypotheses of the study coded the transcripts derived from the free chat conversation. Reliability among coders ranged from .86 to .92 on the following variables.

The transcripts were coded for the number of disclosures that included personal information during the free chat conversation. The disclosures were classified as either *spontaneous self-disclosures* or *prompted self-disclosures*. A spontaneous self-disclosure occurred when a participant revealed personal information about herself without the

partner requesting it (Joinson, 2001). Disclosures given in response to a question asked by the partner or elicited by matching the spontaneous self-disclosure given by the partner were considered to be prompted self-disclosures.

Coders also indicated each time a new topic was introduced into the conversation. Participants were credited for the number of topics that they introduced during the free chat. The *topics started* score was the total number of topics that each participant introduced. *Original questions* represented the first appearance of a question during the conversation, such as "What's your name?" asked by one participant to the other. A *reply question* was any question that echoed a previously asked question, such as replying to the first question with, "I'm Erin, what's yours?" asked by the second participant. The question did not have to be verbatim. It needed only to request the same information as another question.

Traditional Linguistic Measures. The scores for the remaining variables were calculated using Microsoft Excel. *Total word count* included the number of words that each participant typed during the 20 min. Internet abbreviations, e.g., "lol" (laugh out loud) and "omg" (oh my god), were counted as one word instead of three. *Total number of turns* was coded as the sum of the number of turns taken by each participant. Each message sent by a participant was counted as one turn. *Mean word count per turn* was calculated based on the total word count and the total number of turns: The total word count divided by the total number of turns yields the mean word count per turn for each participant. *Double turns* counted every time one partner took a turn immediately following her last turn without giving her partner a chance to reply. If one partner

entered three messages before her partner entered one, it was counted as two double turns. The free chat transcripts were also coded for the number of *first person pronouns* and *second person pronouns* used.

Internet-Specific Communication Measures. The transcripts were coded for *emoticons* (e.g., ☺ smiling face,) and the use of Internet-specific lexis (e.g., "ne1" for anyone, see Jansen, 2005, for an exhaustive list). The Internet-specific lexis was subcategorized into words that represented an action (e.g., "lol" representing laugh out loud) and into words that did not represent an action (e.g., "b4" representing before). Microsoft Excel © was used to calculate the Internet-specific communication measures.

Affect in Language Measures. The transcripts were coded for affect in language using the Dictionary of Affect computer program.[1] Reliability and validity of this tool are reported elsewhere (see Whissell, Fournier, Pelland, & Werr, 1986). The dictionary of affect comprises roughly one third of a million words. Each individual word has been rated on two dimensions: activation and pleasantness. Eight subscales are established from these two dimensions (Whissell, 1999): words high in pleasantness, but neutral in activation, are labelled as *pleasant* words; words rated low in pleasantness and neutral in activation are labelled as *unpleasant* words; words high and low in activation, but neutral in pleasantness, are labelled as *active* and *passive*, respectively; words high in both activation and pleasantness are labelled as *fun* or cheerful words; words high in activation and low in pleasantness are labelled as *nasty* words; words low in activation and high in pleasantness are labelled as *nice* or soft words; and words low in both activation and

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[1] Coding was performed by Dr. Cynthia Whissell, Department of Psychology, Laurentian University. The coder was blind to the hypotheses of the study and participant classification.

pleasantness are labelled as *sad* words. Additionally, an *overall pleasantness* score (regardless of level of activation) and an *overall activation* score (regardless of level of pleasantness) are calculated. An *imagery* score is also calculated which represents the use of concrete words (e.g., chair and dog) compared to abstract words (e.g., intelligence and before).

Data Analyses

We performed a mixed linear model analysis because participants within a dyad influence each other and do not provide independent behavioral data. This method of analysis is routinely used for dyadic studies to account for non-independence and is reported elsewhere (Cook & Kenny, 2005). For each variable, a linear mixed model using SPSS with dyads as the subject and member as the repeated variable was performed. The individuals within each dyad were treated as distinguishable based on their membership to the high or low shy groups.   Webcam condition and shy group were entered as a factor. A separate mixed linear analysis was performed on each dependent measure coded from the transcripts.

Results

Conversation Style Measures

It is reasonable to assume that individuals who took more turns would have an advantage in opportunities to self-disclose information. Therefore, we controlled for the number of turns taken to ensure that differences in self-disclosure were related to shyness and webcam condition and not differences related to number of opportunities to self-disclose. The analysis revealed a statistically significant Shy Group X Webcam

Condition interaction on the spontaneous self-disclosure measure [$F(1, 10.85) = 5.26, p = .043$] (see Figure 3.2).

As predicted, shy participants in the webcam condition ($M = 3.48, SE = .56$) made statistically significantly fewer spontaneous self-disclosures than shy participants in the no webcam condition ($M = 8.19, SE = 1.13$) [$t(10.02) = -3.56, p = .005$], and non-shy participants in either the webcam condition ($M = 7.58, SE = 1.42$) [$t(10) = -2.83, p = .018$] or the participants in the no webcam condition ($M = 7.90, SE = 1.87$) [$t(8.27) = -2.25, p = .05$]. However, contrary to prediction, there were no statistically significant main or interaction effects on the prompted self-disclosure measure.

The analyses also revealed a statistically significant main effect for Shy Group on the number of topics each participant started [$F(1, 12) = 11.55, p = .005$]. Shy participants started statistically significantly fewer topics ($M = 5.21, SE = .76$) than non-shy participants ($M = 10.43, SE = 1.19$) regardless of webcam condition. There were no statistically significant main or interaction effects on the original questions or for the reply questions measures.

Affect in Language Measures

The analysis revealed a statistically significant main effect for Shy Group on use of pleasant and active words (i.e., fun words) [$F(1, 12) = 6.78, p = .023$]. As predicted, shy participants ($M = .043, SE = .004$) used a statistically significantly lower proportion of fun words compared to their non-shy participants ($M = .054, SE = .005$) (see Figure 3.3). However, the predicted Shy Group X Condition interaction on the use of affect language was not statistically significant. There were, however, trends for shy

participants to use fewer overall pleasant words [$F(1, 12) = 3.40$, $p = .090$] and overall

active words [$F(1, 12) = 4.07$, $p = .067$], and more imagery words [$F(1, 12) = 3.32$, $p = .093$] than their non-shy counterparts.

Traditional Linguistic Measures and Internet-Specific Communication Measures

There were no other statistically significant main or interaction effects for Shy

Group and Webcam Condition on any of the traditional linguistic measures or on any of

the Internet-specific communication measures.

Discussion

Are shy adults really bolder online? We found that it appears to depend on the

context. Context appears to influence some, but not all, aspects of computer-mediated

social communication in shy adults. Shy participants made statistically significantly

fewer spontaneous self-disclosures with an unfamiliar adult only in the presence of a live

webcam. Shy adults looked the same as non-shy adults in the no webcam condition.

Interestingly, the findings were specific to the spontaneous self-disclosure measure.

Contrary to our prediction, we did not find statistically significant differences between

the shy groups on the other computer-mediated communication variables: measures that

have been linked to shyness (e.g., total word count). Overall, the present results are

consistent with our recent findings with a sample not selected for shyness (Brunet &

Schmidt, 2007) and extend those findings to a spontaneous computer-meditated self-

disclosure measure in a sample selected for shyness. The results also extend other recent

studies in which shyness was found to be related to greater Internet use (Ebeling-Witte,

Frank, & Lester, 2007) and display of the shy person's true-selves online (Sheeks &

Birchmeier, 2007), likely due to the anonymity provided by the Internet (Roberts et al., 2000).

Shy adults also started fewer topics during the conversation than did their non-shy counterparts regardless of the presence or absence of the webcams. This finding is consistent with previous FTF research that demonstrated that shy individuals are more reactive and less initiative during social interactions (Pilkonis, 1977). Our findings extend this research by specifying that shy individuals' reactivity is more robust for initiating conversations and topics than for spontaneous self-disclosing information. It appears that with visual anonymity, shy individuals are able to self-disclose more information once a topic has been introduced, but are less able to introduce topics into their conversations.

Shy individuals also used less fun words than non-shy individuals. Fun words are high in activation and high in pleasantness. Shyness does influence affective word choice, but it appears to be not dependent on context. It is not surprising that shy individuals used less fun words since previous research has demonstrated a relation between shyness and passivity (Paulsen, Bru, & Murkerg, 2006) and that shy individuals view social interactions as being unpleasant. Therefore, despite online interactions being more pleasant, shy individuals were unable to match their non-shy peers in their use of fun words. However, the association of shyness with passivity and unpleasantness did not result in shy individuals using more passive, unpleasant, or sad (i.e., low in activity and pleasantness) words.

We found that individual differences in shyness and context interacted in a systematic way to influence some, but not all, aspects of computer-mediated social communication. Given that differences in the *quantity* of self-disclosure in relation to shyness and context have been now established on two separate self-disclosure measures and in two separate studies and participant designs, it might be helpful if future studies examined, with larger sample sizes, the *qualitative* aspects of self-disclosure in order to further understand the nature of shyness X context interactions on social communication.

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Figure Captions

Figure 3.2. Mean differences (SE bars) between shy and non-shy young adults on computer-mediated spontaneous self-disclosures as a function of a live webcam or no webcam condition

Figure 3.3. Mean differences between shy and non-shy adults on proportion of words used for each of the eight measures of affective quality of language used
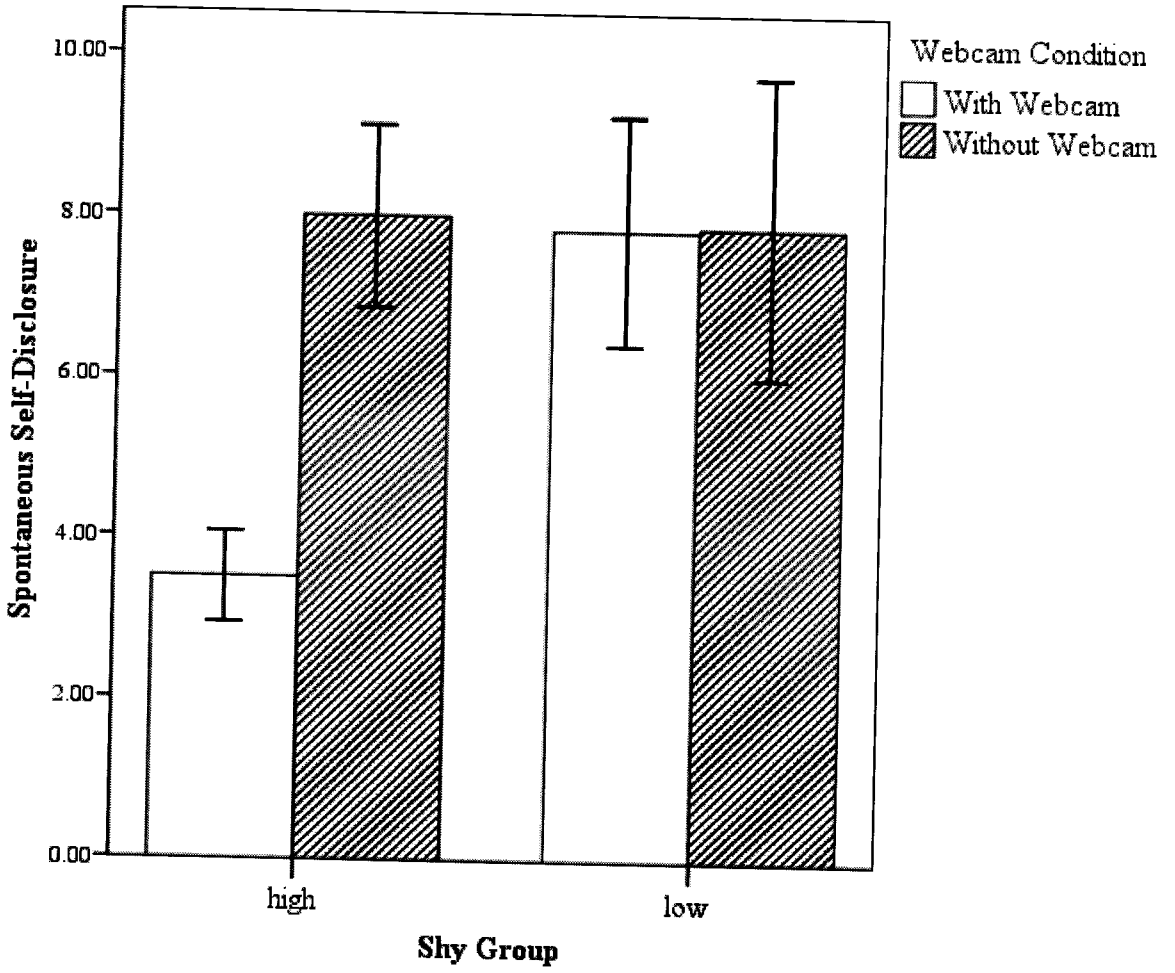
Figure 3.2.

Figure 3.3.
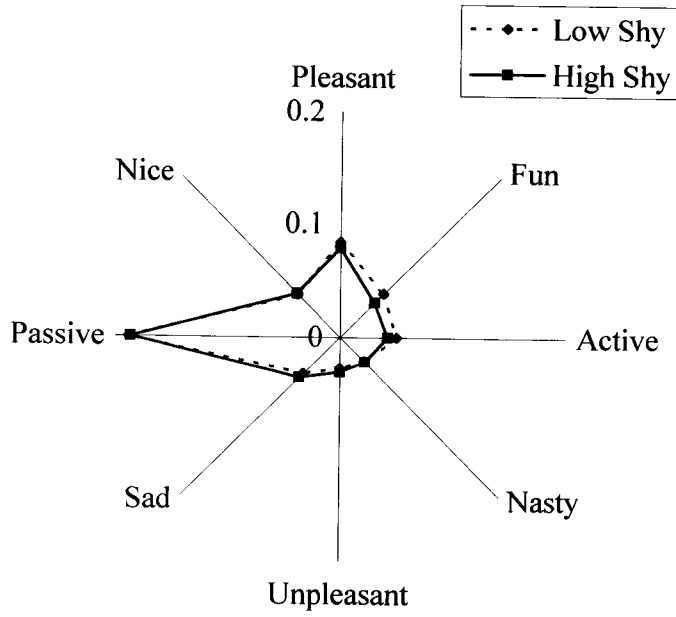
Chapter 4

Are person by context interactions on computer-mediated social communication specific to shyness? Examination of other individual difference characteristics

Studies 3 and 4

Study 3:

Person-Context Interactions on Computer-mediated Social Communication:

Influence of different domains of self-concept and context

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Abstract

We examined the influence of different domains of global self-worth (i.e., self-esteem and loneliness) and context on computer-mediated social communicative behaviour. One hundred and sixteen unfamiliar female undergraduate students were paired into 58 dyads. Dyads were randomly assigned to either a webcam or no webcam condition in the laboratory. Participants in the dyads then engaged in a 10 min free chat conversation via an instant messenger over the Internet. Online conversations were archived and transcripts were subsequently coded for communication style, traditional linguistic, and Internet-specific measures. Participants also completed self-report personality measures of self-esteem and loneliness. A linear mixed model was used for data analysis of the dyadic interactions revealed statistically significant Self-esteem X Webcam condition interactions on computer-mediated prompted self-disclosures and number of topics started during the dyadic interaction. Self esteem was negatively related to prompted self-disclosures but only in the no webcam condition. As well, increases in self-esteem were related to decreases in the number of topics started only in the webcam condition. For loneliness, no Person X Context interactions were found. Regardless of the condition, increases in loneliness were related to decreases in spontaneous self-disclosures. Results suggest that some aspects of global self-worth are more sensitive to context than others during unfamiliar social interactions.

Introduction

There is a long and rich history in the fields of personality and experimental social psychology examining the influences of personality and context on social behavior (see e.g., Bem & Allen, 1974; Zuckerman, Bernieri, Koester, & Rosenthal, 1989). Funder and Colvin (1991) have argued that inconsistency in behaviour is not indicative of inconsistency in personality, rather it illustrates that the interaction between the situation (i.e., context) and the person (i.e., personality traits) determine behaviour.

For example, Snyder and Monson (1975) demonstrated that the interaction between context (a private discussion among 4 participants versus a public discussion among 4 participants in a room with a video camera, microphone, and one-way mirror) and person (levels of neuroticism) influenced behaviour (amount of social conformity). They found that high neurotic individuals displayed consistently the same amount of social conformity regardless of the situation, whereas low neurotic individuals displayed greater conformity in the public discussion context.

The influence of the person-context interaction is not limited to personality traits. Other stable aspects of a person can interact with the situation to influence behaviour. For example, Thomson and Rapee (2002) found that social anxiety interacts with context (structured versus unstructured conversation). When participants, paired with a confederate, are given no instructions to engage in conversation, socially anxious participants displayed poorer conversation skills. In a situation in which the participants paired with a confederate are given specific instructions to converse, socially anxious

participants display better conversation skills. Non-socially anxious participants engage consistent behaviour across both conditions.

The Person X Context interaction also extends to other components of the self. Self-esteem is arguably one of the most central (Greenwald, Bellezza, Banaji, 1988) and most researched (Campbell, Trapnell, Heine, Katz, Lavellee, & Lehman, 1996) component of the self. Loneliness is another component, which is specifically linked to the negative aspects of the self-concept (Goswick & Jones, 1981; Kalliopuska & Laitinen, 1991).

It has been suggested that individuals who have difficulties in engaging in face-to-face (FTF) social interactions due to shyness (Roberts, Smith, Pollock, 2000), low self-esteem (Caplan, 2002, 2003), or loneliness (Moran-Martin & Schumacher, 2003) are more at ease in computer-mediated communication (CMC) social interactions. The findings of studies focusing on self-report and interviews are indicative that individuals with problematic FTF social interactions show a preference for CMC as a medium for social interaction (Joinson, 2004; Shaw & Gant, 2002; Shepherd & Edelmann, 2005). By using the Internet as a psychological laboratory, we can determine if this preference translates into behavioural differences in various contexts by manipulating the presence of visual and/or auditory cues. Doing so allows for a re-investigation of traditional questions, such as determining if personality traits are context specific, to be explored with more precision as we can control more factors than in traditional studies (e.g., issues of exposure, control levels of reciprocation, verbal and visual cues).

The advantage of using Internet paradigms is that researchers can control the social interaction of two participants by allowing or excluding visual cues and auditory cues and because communication is typed, the degree and speed of reciprocal communication that is often difficult to control in traditional studies involving face-to-face interactions.

Joinson (2001) used an Internet paradigm in two separate studies to investigate the effect of anonymity on self-disclosure of positive and negative personal information during a dyadic cooperative task. In the first study, half of the dyads were assigned to a face-to-face condition and the other half to a visually anonymous Internet chat condition. In a second study, dyads were assigned either to the visually anonymous Internet chat condition or non-anonymous Internet chat condition achieved by using video conferencing. Participants disclosed more in the Internet condition compared to the face-to-face, but there were no differences between the visually anonymous and non-anonymous Internet conditions.

In two previous studies, we paired undergraduate female students into dyads who were not selected for shyness (Brunet & Schmidt, 2007) and who were selected for extremes in shyness (Brunet & Schmidt, in press). The members of each dyad engaged in a chat conversation via an instant messenger. Half of the dyads were able to see one another via a webcam, and the other half did not have visual cues provided. The transcripts derived from the chat were coded for traditional communication variables. In these studies, we found a Person X Context interaction for shyness. Increases in shyness

were related to decreases in self-disclosure only in the webcam condition. Without the webcam, this relation did not exist.

The purpose of the present study was to extend our prior work on Person-Context interactions on computed-mediated social behaviour to specific aspects of the self-concept. Shyness reflects a pre-occupation of the self in responses to real or imagined social interactions. We know, however, little about what exact cognitive affective components of the self play in the maintenance of shyness. Shyness is highly related to at least two aspects of the self, self-esteem – an evaluative cognitive measure of one's self-concept (Greenwald, Banaji, Rudman, Farnham, Nosek, & Mellot, 2002), and an affective loneliness component – a measure of isolation (Dill & Anderson, 1999). Here we attempted to extend our earlier findings on the influence of shyness and context on computer-mediated behaviour by systematically examining the influence of different aspects of the self and context on computer-mediated social behaviour.

To examine the extent to which different components of the self concept affects behaviour, we investigated the Person X Context interactions associated with the levels of self-esteem of the participants and separately associated with participants' levels of loneliness. By applying the same design from our previous studies to the current study, we were able to determine potential effects of actor's self-esteem and partner's self-esteem on participants' behaviors during an online conversation for one model, and actor's loneliness and partner's loneliness for another model.

We predicted that with a webcam, individuals low in self-esteem would be more reserved compared to individuals high in self-esteem. In particular, we expected that

individuals low in self-esteem would make fewer self-disclosures, ask fewer questions, and start fewer topics. These predictions are in line with previous research demonstrating that women with high self-esteem tend to disclose more information about themselves than women low in self-esteem (Dolgin, Meyer, & Schwartz, 1991). Furthermore, we anticipated these effects to be stronger for participants who could see one another via webcams than for participants who did not have webcams. Similarly, we predicted that participants' levels of loneliness would affect behaviour for the participants who could see one another via webcams but would have less of an effect on the behaviour of participants who were chatting without the webcams. The predictions regarding loneliness are based on previous research that demonstrated that lonely females self-disclose less in same-sex dyads (Solano, Batten, & Parish, 1982).

Method

Participants

Participants were 116 undergraduate female students who ranged in age from 17 to 24 years ($M = 19.60$ years, $SD = 1.74$ years) and who were recruited from undergraduate classes at McMaster University. All participants received either experimental credit in one of their undergraduate psychology classes or $10 remuneration for their participation.

Apparatus

Two isolated testing rooms were each equipped with an Internet accessible laptop and a Creative NX Pro webcam. For the webcam condition, the webcams were centered and secured onto the laptop. During the no webcam condition, the webcams were not

present. The image size broadcasted by the webcams was 320 X 240 pixels. The entire head and face of each participant was visible via the webcam. Yahoo! Messenger was chosen as the instant messenger due to its message archive option, which automatically saved the conversations and the precise time that each message was sent.

Procedure

Participants were scheduled to arrive 5 minute apart to avoid meeting one another prior to the start of the experiment. Upon their arrival, they signed consent forms and were given instructions about the experiment. All procedures were approved by the McMaster Research Ethics Board.

The participants were paired to form 58 same-sex dyads. Each dyad was randomly assigned to either the webcam condition (27 dyads) or the no webcam condition (31 dyads). When the participants in the webcam condition entered the testing rooms the lens of the webcams were covered to ensure the participants did not see one another before the experiment started. The experimenters removed the page blocking the lens when the conversation started. The participants in the webcam condition were only able to see one another; no auditory information was transmitted. Participants in the no webcam condition could neither see nor hear one another.

The participants engaged in a 10-minute conversation with their partner via the instant messenger. The participants were unfamiliar to one another. The experimenters instructed the participants to get to know one another by chatting about any topics of their choosing. However, they were restricted from insulting one another. The experimenters

were not in the testing rooms during the 10-minute period. They re-entered after 10 minutes to terminate the conversation.

Following the online conversation, the participants completed an Internet Activity Questionnaire asking them about their Internet habits (e.g., hours spent using instant messengers and number of friends on buddylist). They also completed the Revised UCLA Loneliness Scale (Russell, Peplau, & Cutrona, 1980), consisting of 20 items answered on a 4-point likert scale (α = .88 for this study). Sample items of the R-UCLA include "I lack companionship" and "I feel left out". Reliability and validity data are provided in Russell et al. (1980). Additionally, participants completed the Coopersmith Self-Esteem Scale (Coopersmith, 1967), consisting of 25 items (α = .81 for this study) answered on a dichotomous scale ("like me", "not like me"). Sample items of the Coopersmith Self-Esteem Scale include "I often wish I was someone else" and "I'm a lot of fun to be with". Reliability and validity data for this measure are presented in Coopersmith (1967). All participants reported being well versed in Internet usage. Self-esteem and loneliness were not systematically related to the amount of time spent on the Internet chatting, nor related to the level of comfort with using the Internet.

Computer-Mediated Communication (CMC) Coding and Measures

We coded the transcripts for four types of CMC behavior: conversation style measures, affective quality of language measures, traditional linguistic measures, and Internet-specific communication measures.

Conversation Style Measures. These measures included the questions asked during the conversation and were classified into two types. The first type was *original*

questions, which was the first time a question was asked during the conversation (e.g., "where are you from?"). A *reply question* was any question that copied a previously asked question (e.g., "I'm from Sudbury, you?"). The question did not necessarily have to be verbatim, but simply needed to request the same information as previously asked question. Additionally, the transcripts were coded for two types of self-disclosures made during the conversation by each participant. The two categories were *prompted self-disclosures* and *spontaneous self-disclosures*. Disclosures that were elicited by the other participant asking a question or by giving the same information first were labeled as prompted. When a participant volunteered a disclosure was without being prompted by the partner, it was considered to be a spontaneous self-disclosure (Joinson, 2001). Coders also indicated each time a new topic was introduced into the conversation. Participants were credited for the number of topics that they introduced during the free chat. The total number of topics that each introduced was their *topics started* score.

Two research assistants (RA's) who were trained on computer-mediated communicative behavior coding and who were blind to the purpose and hypotheses of the study each coded half of the transcripts derived from the chat conversation. Thirty-six of the transcripts were coded by both RAs. The inter-rater reliability for these five conversation style measures ranged from .65 to .94 for these transcripts. The remaining 22 transcripts were only coded once.

Affective Quality of Language. All of the transcripts were coded for the affective quality of language using the Dictionary of Affect software.[2] The reliability and validity

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[2] Coding was performed by Dr. Cynthia Whissell, Department of Psychology, Laurentian University.

of this tool have been established and reported elsewhere (see Sweeney & Whissell, 1984; Whissell & Charuk, 1985; Whissell, Fournier, Pelland, & Werr, 1986). The dictionary of affect is composed of approximately one third of a million words, each of which has been rated on 2 dimensions; activation and pleasantness. From these two dimensions, eight subscales have been created (Whissell, 1999): 1) *pleasant* (high in pleasantness, neutral in activation), 2) *unpleasant* (low in pleasantness, neutral in activiation), 3) *active* (high in activation, neutral in pleasantness), 4) *passive* (low in activation, neutral in pleasantness), 5) *fun* or cheerful (high in both dimensions), 6) *sad* (low in both dimensions), 7) *nasty* (high in activation and low in pleasantness), and 8) nice (low in activation and high in pleasantness). Additionally, an *overall pleasantness* score (regardless of level of activation) and an *overall activation* score (regardless of level of pleasantness) are computed for each participant. An *imagery* score is also calculated which represents the use of abstract words (e.g., intelligence and before) compared to concrete words (e.g., table and cat).

Traditional Linguistic Measures. These measures included for each participant, their *total word count*, which was the sum of the words that each participant typed and sent during the conversation. Internet abbreviations [e.g., "lol" (laugh out loud) and "omg" (oh my god)] were counted as one word instead of three. *Total number of turns* was coded as the sum of the number of turns taken by each participant. Each message sent by a participant was counted as one turn. *Mean word count per turn* was calculated by dividing the total word count by the total number of turns. *Double turns* counted every time one partner took a turn immediately following her last turn without giving her

partner a chance to reply. If one partner entered three messages before her partner entered one, it was counted as two double turns. The free chat transcripts were also coded for the number of *first person pronouns* and *second person pronouns* used. Microsoft Excel © was used to calculate the tradition communication measures.

Internet-Specific Communication Measures. These measures comprised the number of emoticons that each participant used (e.g., ☺ smiling face) and for total amount of Internet-specific lexis (e.g., "brb" for be right back, see Jansen, 2005 for an exhaustive list). Additionally, Internet-specific lexis was subdivided into abbreviations that represented an action (e.g., "rofl" for rolling on the floor laughing) and into a non-action category (e.g., "omg" for oh my god). Microsoft Excel © was used to calculate the Internet-specific communication measures.

Results

Self-Esteem

Conversation Style Measures. We predicted that increases in self-esteem would be related to increases in self-disclosure more so in the webcam condition. The analysis revealed a statistically significant Actor's Self-Esteem X Webcam Condition interaction on the number of prompted self-disclosures made during the conversation [$F(1, 95.516) = 4.73, p = .032$] (see Figure 4.1). However, contrary to our prediction, self-esteem affected the number of prompted self-disclosures in the no webcam condition and not in the webcam condition. As Actor's Self-Esteem increased, the number of prompted self-disclosures made decreased in the no webcam condition [$\beta = -.064, t = -2.101, p = .040$], but no such relation existed in the webcam condition [$\beta = .025, t = .775, p = .443$].

The analysis revealed a statistically significant Actor's Self-Esteem X Webcam Condition interaction on the number of *topics started* [$F(1, 102.977) = 5.041, p = .027$] (see Figure 4.2). In the webcam condition, as Actors' Self-Esteem increased, the number of topics participants started statistically significantly decreased [$\beta = -.057, t = -2.583, p = .013$], which does not support the prediction that the number of topics started would increase with increased in self-esteem. In the no webcam condition, there was no statistically significant relation between Actor's Self-Esteem and the number of topics they started during the conversation [$\beta = .019, t = .781, p = .438$].

There were no other statistically significant main or interaction effects for self-esteem on any of the conversational styles measures coded.

Affective Language Measures. No main or interaction effects were statistically significant. However, three trends did emerge. The analysis revealed a trend of Actor's Self-Esteem on the proportion of sad words (i.e., passive and unpleasant words) used by the participants [$F(1, 102.743) = 2.79, p = .098$], on proportion of passive words [$F(1, 102.804) = 3.40, p = .068$], and on proportion of fun words (i.e., active and pleasant words) [$F(1, 90.544) = 2.87, p = .094$]. As expected, individuals who were lower in self-esteem used a higher proportion of sad words, a higher proportion of passive words, and a lower proportion of fun words.

Traditional Linguistic Measures. The analysis revealed a statistically significant main effect of Partner's Self-Esteem on the number of second person pronouns used by a participant [F (1, 102.067) = 15.98, p = .0005]. As partners' self-esteem increased, participants' use of *second person pronouns* decreased.

There were no other statistically significant main or interaction effects for self-esteem on any of the traditional linguistic measures coded.

Internet-Specific Communication Measures.   There were no statistically significant main effects of interactions for self-esteem on any of the Internet-specific communication measures coded.

Loneliness

Conversation Style Measures.   We predicted that increases in the loneliness would have a statistically significant negative effect on the conversation style measures, especially in the webcam condition. As predicted, the analysis revealed a statistically significant main effect of Actor's Loneliness for the number of *spontaneous self-disclosures* made during the conversation [F(1, 90.757) = 4.770, p = .032). As participants' loneliness increased, the number of spontaneous self-disclosures decreased but it was independent of the webcam condition (Figure 4.3).

There were no other statistically significant main or interaction effects for loneliness on any of the conversational styles measures coded.

Affective Language Measures. For the affective language measures, there were two main effects of Actor's Loneliness. The analysis revealed a statistically significant main effect of Actor's Loneliness on the proportion of active words used by participants

during the chat conversation [$F(1, 90.195) = 5.63, p = .020$]. Participants with the higher

loneliness scores had a higher proportion of active words used. Furthermore, the analysis

revealed that the proportion of nice (i.e. pleasant and passive words) used decreased with

Actor's Loneliness [$F(1, 79.473) = 5.04, p = .028$].

Traditional Linguistic Measures. There were no statistically significant main or

interaction effects of loneliness on any of the traditional linguistic measures coded.

Internet-Specific Communication Measures. There were no statistically

significant main or interactions effects of loneliness on any of the Internet-specific

communication measures coded.

Discussion

Do self-esteem and loneliness influence computer-mediated social

communication? Self-esteem and loneliness both appear to be good predictors of

individual differences in social communicative behaviour during online conversations but

for different types of behaviours. We found that context (i.e., anonymous vs. non-

anonymous) mediated the influence of self-esteem for some behaviours (e.g., prompted

self-disclosures and topics started). Self-esteem was statistically significantly related to

the quantity of prompted self-disclosures made by participants, but the interaction that we

found did not match the interaction that we had hypothesized. We had proposed that

higher self-esteem would be related to a higher quantity of prompted self-disclosures, and

that self-esteem and prompted self-disclosures would decrease proportionally. Also, we

predicted that this effect would be stronger in the webcam condition than the no webcam

condition. Contrary to our predictions, the effect was in the opposite direction and for the

opposite condition. Low self-esteem was related to a higher quantity of prompted self-disclosures in the no webcam condition. Our assumption that participants low in self-esteem would disclose more in the no webcam condition compared to the webcam condition is correct. Additionally, our prediction that participants high in self-esteem would not be influence by webcam context was correct. Unexpectedly, participants low in self-esteem in the no webcam condition disclosed more than the participants high in self-esteem, and in the webcam condition disclosed the same amount.

Context is the most reasonable explanation for the unexpected finding. Not only the context created by the presence or absence of webcams, but more importantly the context of CMC versus FTF. Our prediction was based on the assumption that individuals in the lower end of the self-esteem continuum would at best be able to match individuals in the high end regardless of the context in self-disclosure. We did not expect the low self-esteem individuals would be able to surpass the high self-esteem individuals in self-disclosure. That assumption has proven to be wrong and may possibly be explained by CMC being more appealing to some types of individuals versus others. As suggested by some researchers (Caplan, 2003; McKenna, Green, Gleason, 2002; Roberts, Smith, & Pollock, 2000), individuals who have difficulties with FTF interactions will find CMC interactions appealing, as they are less threatening. Joinson (2004) demonstrated that individuals with low self-esteem showed a stronger preference for email communication compared to their high in self-esteem counterparts. However, these studies also stipulate that individuals who are at ease in FTF interactions will find CMC interactions less appealing because they are already meeting their needs via FTF

interactions. Therefore, CMC may decrease the number of self-disclosures made by people high in self-esteem while at the same time increase the number of self-disclosures made by people low in self-esteem. Additionally, the webcams decreased the high number of self-disclosures made by the people with low self-esteem to a range that is similar to the people with high self-esteem.

It is important to note that this pattern was limited to prompted self-disclosures and was not found for spontaneous self-disclosures. In a study examining differences between elicited (i.e., prompted) and voluntary (i.e., spontaneous) self-disclosure, the findings indicated that elicited self-disclosure had a greater association to self-esteem than voluntary self-disclosure for Japanese university students (Kumano, 2002). Our findings appear to support that same conclusion. Self-esteem seems to be more closely related to prompted self-disclosures than spontaneous self-disclosures.

Similarly to self-disclosure, we had assumed that participants in the lower range of self-esteem would at best match but not surpass the number of topics started by the participants with strong self-esteem. However, in the webcam condition the relation between self-esteem and topics started was negative; meaning that low end of the self-esteem continuum was associated with more topics started. At first glance, it would seem odd that these participants would display bolder behaviour (i.e., starting more topics) especially in the webcam condition that should mimic FTF interactions more closely. Granted, starting topics is more risky as it allows for the partner to judge their topic choices, however, it may be the lesser of two evils. By introducing new topics, it deters the partner from delving too deeply into one topic and forcing the actor to reveal

information of a more personal nature. Therefore, they may prefer to introduce many topics but keep the conversation at a fairly shallow level instead of a deep conversation into one or two topics. The reason that they do so in the webcam condition is that being able to see one another eliminates some of the anonymity so they want to protect themselves more.

Therefore, despite seeming to feel more comfortable with CMC interactions as demonstrated by the increase number of prompted self-disclosures, individuals with lower levels of self-esteem may still be employing techniques to protect their fragile esteem while chatting, especially when webcams are present. To assess the validity of that statement, a future study would need to examine the quality of the topics started and the quality of the self-disclosure. It could be that despite disclosing more information, the disclosures made by individuals with low self-esteem are more superficial.

Unsurprisingly, low self-esteem was related to greater use of sad words and passive words, and related to fewer fun words. However, it is important to note that for the affective language measures, these were trends.

Partner's self-esteem levels also influence participants' behaviour, specifically a negative influence on the use of second person pronouns. The higher a partner's self-esteem, the less a participant used second person pronouns. Two competing ideas may explain this relation. The first is that participants who had a partner with low self-esteem attempted to draw them out more by using more second person pronouns to encourage disclosure. Or, the second idea would be that participants who have a partner with high self-esteem felt it was not necessary to refer to their partner with second person pronouns

since their partner seemed comfortable. Based on the design of this study, we are not able to conclude with certainty which idea explains the effect as the participants were not asked if they consciously employed such techniques or if they could accurately estimate their partner's self-esteem level. However, based on the findings that participants with lower self-esteem scores made more prompted self-disclosures, it would suggest that the first idea is more probable.

Unlike self-esteem, loneliness was not moderated by context of visual anonymity; lonelier participants volunteered less information about themselves regardless of the webcam's presence or absence. This finding is in line with previous research that has demonstrated that lonely individuals do not like to make spontaneous self-disclosures as they judge that behaviour to be risky (Stokes, 1987).

The context created by the presence or absence of the webcams did not interact with loneliness for any of the behaviours. It would seem that, since the visual anonymity provided by the absence of the webcam did not allow for bolder behaviour for lonely individuals, loneliness is less affected by a concern for self-presentation than self-esteem.

The findings of this study are limited to female undergraduate populations and thus should not be generalized to male students. A replication of this study with a male population would be needed to provide findings about self-esteem, loneliness and computer-mediated social communication. Additionally, an extreme groups design for both male and female would be useful especially for self-esteem, as the current study had a limited number of participants with very low self-esteem.

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Figure Captions

Figure 4.1. Self-Esteem X Anonymity interaction. Individuals low in self-esteem who were in the without webcam condition provided the most prompted self-disclosures.

Figure 4.2. Self-Esteem X Anonymity interaction. With webcams, the number of topics started decreased as self-esteem increased.

Figure 4.3. Loneliness was statistically significantly related to the amount of spontaneous self-disclosure regardless of webcam condition; the greater the Actor's Loneliness, the fewer spontaneous self-disclosures made.
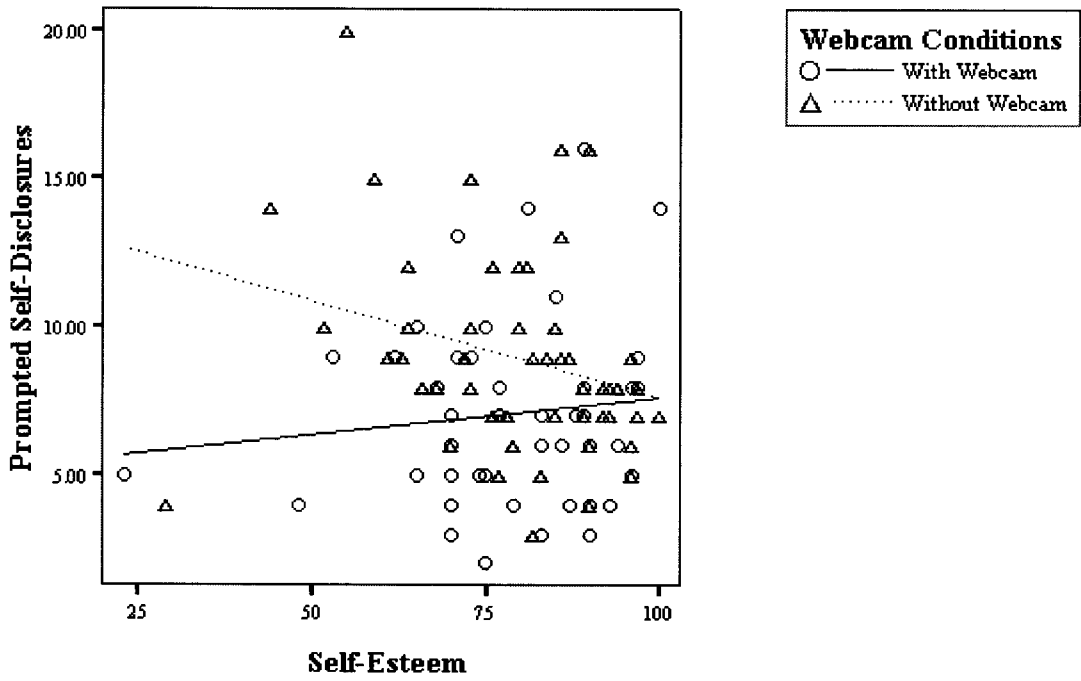
Figure 4.1.

Figure 4.2.

Figure 4.3.

<u>**Study 4**</u>**:**

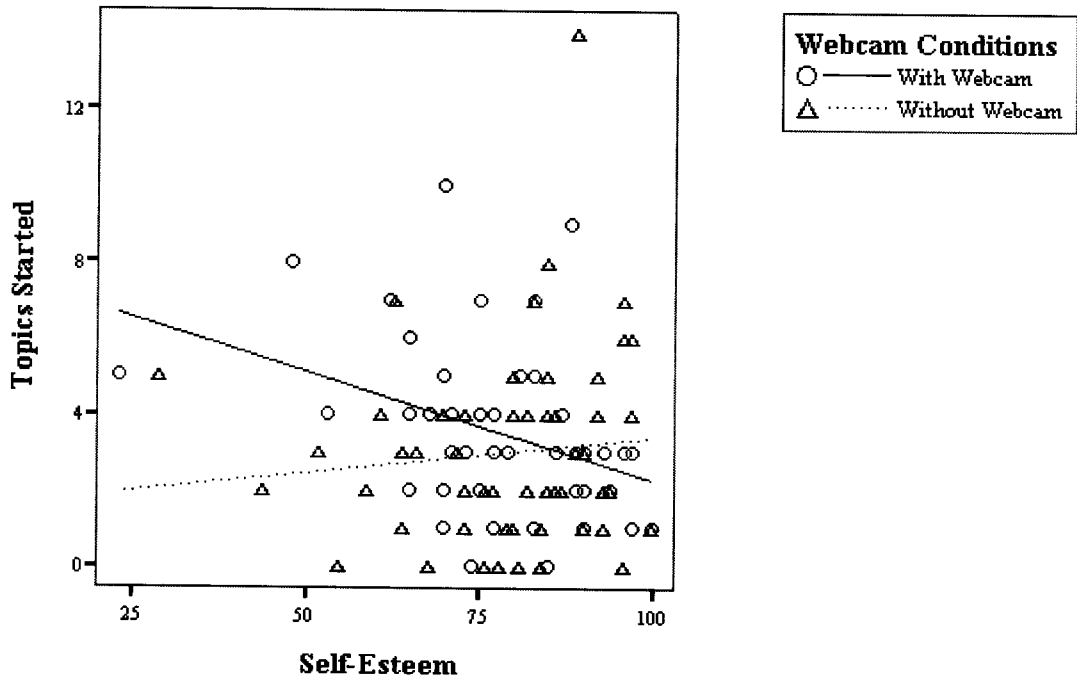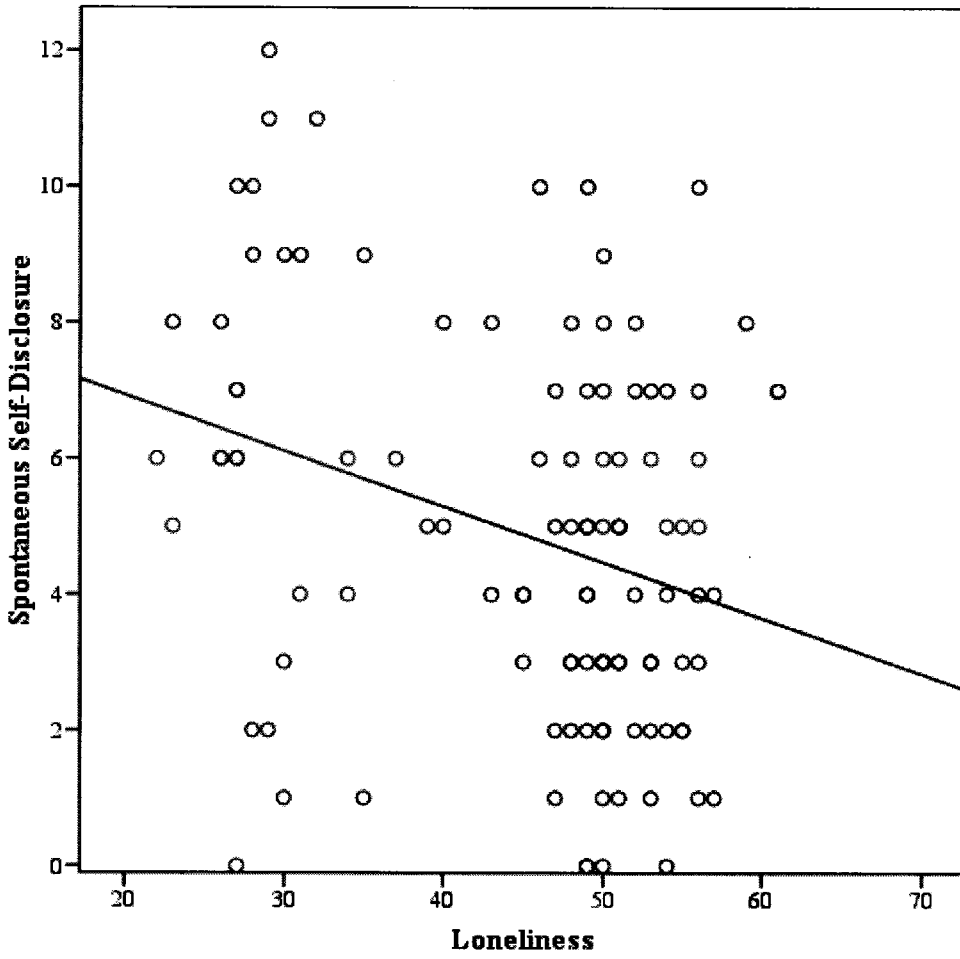**Sex differences in the expression and use of computer-mediated affective language:**

Does context matter?

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Abstract

Although women have been stereotyped as more emotionally expressive than men, the extant empirical evidence on sex differences in the expression and use of affective communication is unclear. We examined the influence of sex and context on the expression and use of computer-mediated affective language in a sample of young adults. Fifty-six undergraduates (28 males, 28 females) were paired in same-sex dyads and randomly assigned to either a webcam or no webcam condition. The participants engaged in a 10 min online conversation in the laboratory. Transcripts were objectively coded for the use of affective communication and traditional linguistic and conversational style measures. The analyses revealed separate significant Sex X Webcam Condition interactions on the affective quality of language used and the expression of computer-mediated emotion. Men in the webcam condition used significantly less active words than men in the no webcam condition and less than women in the webcam condition. Women in the webcam condition used significantly more emoticons than women in the no webcam condition or men in either condition. Men and women did not differ in their use of emoticons in the no webcam condition. Results suggest that sex differences in the use and expression of computer-mediated affective communication are context specific in an undergraduate sample. Findings are discussed in terms of their larger implications for understanding sex differences in the expression and use of emotion in face-to-face social interactions.

Introduction

Identifying and understanding sex differences in social communicative behaviour

has long been an interest of psychology researchers (Blier & Blier-Wilson, 1989;

Fitzpatrick, Mulac, & Dindia, 1995; O'Kearney & Dadd; Tannen, 1996) and the lay

population, which accounts for the popularity and infamy of the metaphor that "men are

from Mars, women are from Venus" (Gray, 1992). Communicative behaviour in social

settings and interactions is particularly relevant to the sex differences debate as it

underlies relationship and friendship formation and maintenance, and access to support

networks. Traditionally, this area of research has focused on asking questions regarding

the social communicative behaviour of men and women in face-to-face settings (FTF).

One common finding is that women are more emotionally expressive than men in

both the expression of emotions (Gross & John, 1998) and the disclosure of feelings

(Dosser, Balswick, & Halverson, 1983; Highlen & Gillis, 1978; Highlen & Johston,

1979). Sex differences in social communicative behaviour have also been reported to be

moderated by contextual cues. For example, the sex of their conversation partner

moderates the emotional self-disclosure of men but not of women (Burleson, Holmstrom,

& Gilstrap, 2005). Men self-disclose less about emotional matters to other men

compared to men disclosing to women, and women disclosing to men or women.

However, others have reported that men disclose more than women regardless of the sex

of their conversation partner (Leaper, Carson, Baker, Holliday, & Myers, 1995).

Consequently, additionally contextual cues must be considered to explain the conflicting

findings.

With the advent of the Internet and its popularity as a social medium, new contextual cues have emerged. The medium itself is a new context given that individuals are socializing, creating and maintaining relationships, and exchanging information via a text-based format. Traditional questions of how men and women differ in social communicative behaviour in face-to-face settings have been extended to Internet social communicative behaviour. For example, questions regarding sex differences in the expression of emotions during social interactions have been reformulated as questions regarding the use of emoticons (e.g., graphic representations of emotions) during computer-mediated communication (CMC). Similarly to the traditional studies, studies on the sex differences of emoticon use provide conflicting findings. Witmer and Katzman's (1997) study provide support that women use more emoticons, but Huffaker and Calvert (2005) found that men favoured emoticons more than women. Others focus on differences in social communicative behaviour and emotion expression exhibited CMC versus FTF (see Derks, Fischer, & Bos, 2008, for a review).

Not only is the Internet a new medium of social communication, it allows for the manipulation of additional contextual cues such as anonymity. Thomson (2006) used the Internet to keep the sex of quartets (2 men and 2 women) anonymous during discussions of male versus female specific topics. Without knowing the sex of the other 3 people, women self-disclosed more information and asked more questions than did the men. However, this study did not provide the alternative condition of non-anonymity of the sex of the quartet members.

The anonymity associated with the Internet has been suggested as a contextual cue that would eliminate personality differences and sex differences in social communicative behaviour. For example, it has been hypothesized that shy individuals would behave more boldly during CMC conversation due to the anonymity provided by the Internet. In a series of recent studies, Brunet & Schmidt (2007; in press) tested that hypothesis by pairing individuals into dyads and randomly assigning them to chat without a webcam (i.e., visually-anonymous condition) or with a webcam (i.e., non visually-anonymous condition). Increases in self-reported shyness were found to be related to decreases in self-disclosure only in the presence of a live webcam. These findings were noted in individuals who were not selected for shyness (Brunet & Schmidt, 2007) and in individuals who were selected for shyness (Brunet & Schmidt, in press).

The purpose of the present study was to examine whether visual anonymity moderated potential sex differences in social communicative behaviour during CMC conversation. We examined specific computer-mediated communication measures during an online free chat conversation in young adults who were paired in sex-matched dyads with and without a webcam in the laboratory. The two conditions of the experiment are representative of the two most popular methods of synchronous CMC conversations (i.e., text-based, and text-based paired with silent webcam transmission).

We coded the transcripts obtained during the online free chat for affective communication (i.e., Internet-specific measures such as emoticons, language denoting action and non-action; affective quality of language; and self-disclosure). We also coded traditional communication measures (e.g., mean word count, total word count). We

expected that in the non visually-anonymous condition to find traditional sex differences (e.g. women making more self-disclosures and using more expressive languages). In the visually-anonymous condition, we predicted that the traditional sex differences will not be present.

Method

Participants

Participants were 56 (28 males and 28 females) undergraduate students who ranged in age from 17 to 23 years ($M = 19.18$ years, $SD = 1.35$ years) and who were recruited from undergraduate classes at McMaster University (Hamilton, Ontario). All participants received course credit for their participation.

Apparatus

Each participant was seated within an isolated testing room. Both rooms were equipped with Internet accessible laptops and a Creative NX Pro webcams. The webcam was centered and attached to the top of the laptop during the webcam condition and was removed during the no webcam condition. The image size broadcasted by the webcam was 320 X 240 pixels, thereby projecting the entire head and face of each participant. Yahoo! Messenger was chosen as the instant messenger due to its message archive option, which automatically saved the conversations.

Procedure

To prevent the participants from meeting one another prior to the experiment, they were scheduled to arrive 5 min apart and ushered to different rooms in the laboratory upon their arrival. Before the online conversations began, the participants were briefed

about the nature of the study and signed consent forms. All procedures were approved by the McMaster University Research Ethics Board.

The 56 participants were paired to form 28 same-sex dyads. Each dyad was randomly assigned to either a webcam condition (14 dyads) or a no webcam condition (14 dyads). There were an equal number of male and female dyads in each condition, and all participants knew they were paired with someone of the same sex. In the webcam condition, the lens of the camera was covered until the conversation began to ensure that the participant could not see his or her partner. Only visual images (no auditory cues) of the participants were presented continuously via the webcams. The participant was instructed to chat for about 10 minutes with his/her partner to get to know him/her. The topics of conversation were of the participants choosing. The only restriction was to not insult one another. The experimenter terminated the conversation once the time limit was up.

Participants also completed an Internet Activity Questionnaire, asking them about their Internet habits (e.g., hours spent using instant messengers and number of friends on buddy list, comfort level with using the Internet).

Coding and Measures for Computer-Mediated Affective Communication

We coded the transcripts for affective language, conversation style, and traditional linguistic measures.

Affective Language Measures

Affective Quality of Language. The Dictionary of Affect is a computer program designed to code the affective quality of language. The reliability and validity of this tool

have been established and reported elsewhere (see Sweeney & Whissell, 1984; Whissell

& Charuk, 1985; Whissell, Fournier, Pelland, & Werr, 1986). By using this program, the

transcripts were coded for eight categories that are based on two dimensions (i.e.

activation and pleasantness (Whissell, 1999).[3] *Pleasant* words are high in pleasantness

but neutral in activation. The words on the low extreme of pleasant, but neutral in action,

are classified as *unpleasant*. Likewise, words neutral in pleasantness but high or low in

activation are labelled as *active* and *passive* words, respectively. The remaining four

categories are based on words that are in one of the extreme ends for both dimensions.

Fun or cheerful words are high in both dimensions. *Sad* words are low in both

dimensions. *Nasty* words are high in activation and low in pleasantness, whereas *nice*

words are the opposite (i.e., low in activation and high in pleasantness). Additionally, an

overall pleasantness score (regardless of level of activation) and an *overall activation*

score (regardless of level of pleasantness) are calculated. An *imagery* score is also

calculated which represents the use of concrete words (e.g., chair and dog) compared to

abstract words (e.g., intelligence and before).

Internet-specific Affective Communication. These measures comprised the

number of emoticons that each participant used (e.g., ☺ smiling face) and the total

amount of Internet-specific lexis (e.g., "brb" means be right back; see Jansen, 2005, for

an exhaustive list). Additionally, emoticons were subdivided into positive (e.g., smiling

face) and negative (e.g., sad face) and Internet-related lexis was subdivided into

abbreviations that represented an action (e.g., "rofl" for rolling on the floor laughing) and

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[3] Coding was performed by Dr. Cynthia Whissell, Department of Psychology, Laurentian University.

into a non-action category (e.g., "omg" for oh my god). We used Microsoft Excel © to calculate the Internet-specific communication measures.

Conversation Style Measures

These measures included two types of questions asked during the conversation: original questions and reply questions. *Original questions* were the first incidence of a request for specific information (e.g., "Where are you from?"). *Reply questions* mimicked a previously asked original question (e.g., "I'm from Sudbury, you?"). The reply question did not have to be verbatim, but only needed to request the same information as the previously asked question.

Additionally, the transcripts were coded for two types of self-disclosures made during the conversation by each participant: *spontaneous* and *prompted self-disclosures*. When a disclosure was volunteered by a participant without being prompted by the partner, it was considered a spontaneous self-disclosure (Joinson, 2001). Information disclosed as a response to a question or elicited by a partner making a spontaneous self-disclosure was labelled as prompted. Coders also indicated each time a new topic was introduced into the conversation. Participants were credited for the number of topics that they introduced during the free chat. The total number of topics that each introduced was the *topics started* score.

Two research assistants (RAs), both of whom were trained on computer-mediated communicative behavior coding and who were blind to the purpose and hypotheses of the study, coded the transcripts derived from the chat conversations. The inter-rater reliability for these five conversation style measures ranged from .68 to .93.

Traditional Linguistic Measures

These measures included for each participant, their *total word count*, defined as the sum of the words that each participant typed and sent during the conversation. Internet abbreviations [e.g., "lol" (laugh out loud) and "omg" (e.g., oh my god)] were counted as one word instead of three. *Total number of turns* was coded as the sum of the number of turns taken by each participant. Each message sent by a participant counted as one turn. *Mean word count per turn*, which is similar to mean length of utterances in verbal conversations, was calculated by dividing the total word count by the total number of turns. *Double turns* counted every time one partner took a turn immediately following her last turn without giving the partner a chance to reply. If one partner entered three messages before his or her partner replied to one, it was counted as two double turns. The free chat transcripts were also coded for the number of *first person pronouns* and *second person pronouns* used. We calculated the traditional communication measures with Microsoft Excel©.

Data Analysis

We first ensured that men and women did not differ on the amount of exposure or familiarity with the Internet. Separate between-group *t*-tests revealed that men and women did not differ on the number of hours they spent using an instant messenger per week [$t(53) = 1.03, p = .31$], number of face-to-face (FTF) friends on their buddy lists [$t(53) = 1.16, p = .12$], number of CMC only friends on their buddy lists [$t(54) = 1.67, p = .10$], and their comfort level using the Internet [$t(54) = 1.71, p = .09$].

We performed a mixed linear model analysis because the behavioural data obtained from each member of a dyad is not independent. This method of analysis is routinely used for dyadic studies to account for non-independence and is reported elsewhere (Cook & Kenny, 2005; Kenny, 2004; Little & Card, 2005). For each variable, a linear mixed model using SPSS with dyads as the participant and member as the repeated variable was performed. The individuals within each dyad were treated as indistinguishable. Webcam condition and sex were entered as factors. A separate mixed linear analysis was performed on all the traditional linguistic, conversational style, Internet-specific, and affective quality of language measures coded from the transcripts.

Results

Sex Differences on Computer-Mediated Affective Language

Affective Quality of Language. There was a statistically significant Sex X Webcam interaction on the proportion of active words used $[F(1,24) = 6.15, p = .021]$ (see Figure 4.4). Men in the webcam condition ($M = .042, SD = .014$) used statistically significantly fewer active words than men in the no webcam condition ($M = .059, SD = .018$), $[t(26) = -2.44, p = .022]$ and statistically significantly fewer than the women in the webcam condition ($M = .062, SD = .027$), $[t(26) = -2.74, p = .011]$. However, they did not statistically significantly differ from the women in the no webcam condition ($M = .051, SD = .021$), $[t(26) = -1.28, p = .213]$.

In addition, there was a statistically significant main effect of sex on the proportion of passive words used $[F(1, 24) = 6.25, p = .02)$. Men ($M = .207, SD = .041$)

used statistically significantly more passive words than women ($M = .180$, $SD = .035$) regardless of webcam condition.

No other statistically significant main or interaction effects on measures of the quality of affective language used emerged.

Internet-specific Affective Communication. From all of the transcripts, negative emoticons only appeared twice. Consequently, we collapsed the positive and negative emoticon categories into one variable. We predicted a statistically significant Sex X Condition interaction on the Internet-specific affective communication measures. As predicted, the analyses revealed a statistically significant Sex X Condition interaction on emoticon use [$F(1, 24) = 6.15$, $p = .021$]. Women in the webcam condition used statistically significantly more emoticons than women in the no webcam condition [$t(26)= 3.05$, $p = .005$] and more than men in the webcam [$t(26) = 2.68$, $p = .013$] or no webcam [$t(26)= 2.15$, $p = .041$] conditions (see Figure 4.5).

Internet-specific Lexis. We predicted that women would be more expressive online by using statistically significantly more Internet-specific lexis (action and non-action based) regardless of condition. As predicted, there was a statistically significant main effect for Sex on the number of action Internet-specific lexis [$F(1, 24) = 4.78$, $p = .039$]. Women ($M = 3.18$, $SD = 2.64$) used statistically significantly more action Internet-specific lexis than did men ($M = 1.79$, $SD = 1.99$) regardless of condition. Additionally, there was a statistically significant main effect for Condition on non-action Internet-specific lexis [$F(1, 24) = 5.29$, $p = .031$]. Participants in the no webcam condition ($M = 3.71$, $SD = 5.28$) used statistically significantly more action Internet specific lexis than

the participants in the webcam condition ($M = 3.18$, $SD = 4.11$). The analysis did not reveal any statistically significant main or interaction effects on the non-action Internet-specific lexis.

There were no other statistically significant main or interaction effects on the Internet-specific measures.

Sex Differences on Conversation Style Measures

There was a statistically significant main effect of sex on the number of reply questions asked during the conversation [$F(1, 24) = 4.46$, $p = .045$]. Women ($M = 2.32$, $SD = 1.31$) asked statistically significantly more reply questions than did men ($M = 1.57$, $SD = 1.17$).

The results did not support the prediction that women would self-disclose more than men. There were no statistically significant main effects or interactions on the self-disclosure measures, the number of original questions or topics started.

Sex Differences on Traditional Linguistic Measures

There were no statistically significant main or interaction effects on any of the traditional linguistic measures.

Discussion

By using the Internet in the same way that it is used as a social medium by the public, we were able to examine if there were sex differences in the social communicative behaviour during text-based conversations. Furthermore, we were able to investigate the moderating effects of visual anonymity by using webcams. For some aspects of affective language, sex differences were moderated by visual anonymity (e.g.,

active words) and for others the sex differences were consistent regardless of differences in visual anonymity (i.e., passive words). However, the direction of the differences is surprising. Active words have in a previous study been rated as masculine and passive words as feminine (Whissell & Chellew, 1994). Yet, we found that men in the non visually-anonymous (i.e., with webcam condition) had a statistically significantly lower proportion of active words, and all men had a statistically significantly higher proportion of passive words. These findings demonstrated that the computer-mediated social communicative behaviour of men and women as it relates to affective language are not consistent with traditional FTF settings where male speakers are rated higher on dynamism, which in part encompasses active versus passive, than female speakers (Mulac, Incontro, & James, 1985). It would appear that our prediction that the text-based medium of social communication would equalize the sexes in affective language has actually reversed the sex difference in active and passive word use.

However, our findings still support the assumption that women were more emotionally expressive than men, as measured by their greater use of emoticons, but only when the webcam was present. Without the webcam, men and women did not differ in the number of emoticons used. The sex by webcam condition interaction is interesting in that emoticons were originally conceived to compensate for the lack of facial expressions in CMC conversations. Consequently, in the condition lacking in visual cues (i.e., without webcam), the need for emoticons should be greater than in the condition with visual cues (i.e., with webcam). However, we found that women used more emoticons when chatting with webcams. Our findings can be explained by LaFrance and

colleagues' (2003) work that demonstrated sex differences in smiling behaviour (i.e., women smile more than men) increase when individuals are being observed and during engaging social interactions. The webcam provides the ability to be observed, and arguably provides a more active and engaging interactions.

We also found that, as predicted, women were more expressive online than men by using more Internet-specific lexis than men. Women used more of this type of informal language that represented an action (e.g., lol for laughing out loud) than did men. A possible reason may be that women felt more comfortable at adopting a new form of language such as the one that has emerged with CMC, whereas men stick with the informal FTF language with which they are familiar through online chatting.

For the conversational style measures, we hypothesized that women would provide more self-disclosures than men because that pattern is found in FTF settings (Dindia & Allen, 1992). Contrary to prediction, the only conversational style difference was that women asked more reply questions than did men. This finding is consistent with research that demonstrates that women ask more questions in FTF settings (Athenstaedt, Haas, & Schwab, 2004).

For the traditional linguistic measures, sex differences were not found. Recent extant literature has suggested that females are more talkative (i.e., use more words) than males (Leaper & Smith, 2004), although others have noted no differences between men and women on talkativeness measures (e.g., James & Drakich, 1993). However, the Leaper and Smith findings were based on a meta-analysis of sex differences and language, while the James and Drakich findings were from a single study. Our results

could be possibly interpreted as demonstrating that verbal talkativeness does not transfer to "talkativeness" in a written communication medium.

The present findings are not without limitations. First, the study is limited because of the sample size and the use of only undergraduates. Accordingly, caution needs to be exercised concerning the generalizability of the data to the general population. Perhaps with a larger sample and the use of non-university students, a clearer pattern of sex differences would emerge than noted herein. Second, extending the length of conversation time may provide more information about how men and women differ in their talkativeness and conversation styles by allowing the participants more opportunity to disclose. Third, systematic manipulation of auditory cues, in addition to the visual cues, may provide additional insight into sex differences in the expression of computer-mediated emotion, given that audition plays such an important role in the communication of emotion. Fourth, it would be helpful to analyze conversations of mixed-sex dyads due to the fact that many of our current findings may be specific to same-sex dyads.

The results of the present study suggest that sex differences in the use of emotional expressivity, language, and communication style are context-dependent not only in modes of communication (i.e., written versus spoken), but also in the presence or absence of specific cues (i.e., visual cues). Researchers have suggested that context is important when examining sex differences (Dindia & Allen, 1992). With increasing attention given to the study of human emotion over the last decade, our findings support the notion that 1) research in this domain needs to consider contextual influences when examining sex differences in the expression and use of emotion, and 2) the use of the

Internet and computer technologies as tools may be advantageous in the study of individual differences. The present results also have practical implications for understanding how to manage some disorders of emotion that are known to differ between men and women. That is, manipulation of particular contexts may be more beneficial to one sex than the other in the treatment of some disorders of emotion.

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Figure Captions

Figure 4.4. Mean (SE bars) differences between women and men on proportion of active words used with and without the presence of a live webcam.

Figure 4.5. Mean (SE bars) differences between women and men on number of emoticons used with and without the presence of a live webcam.
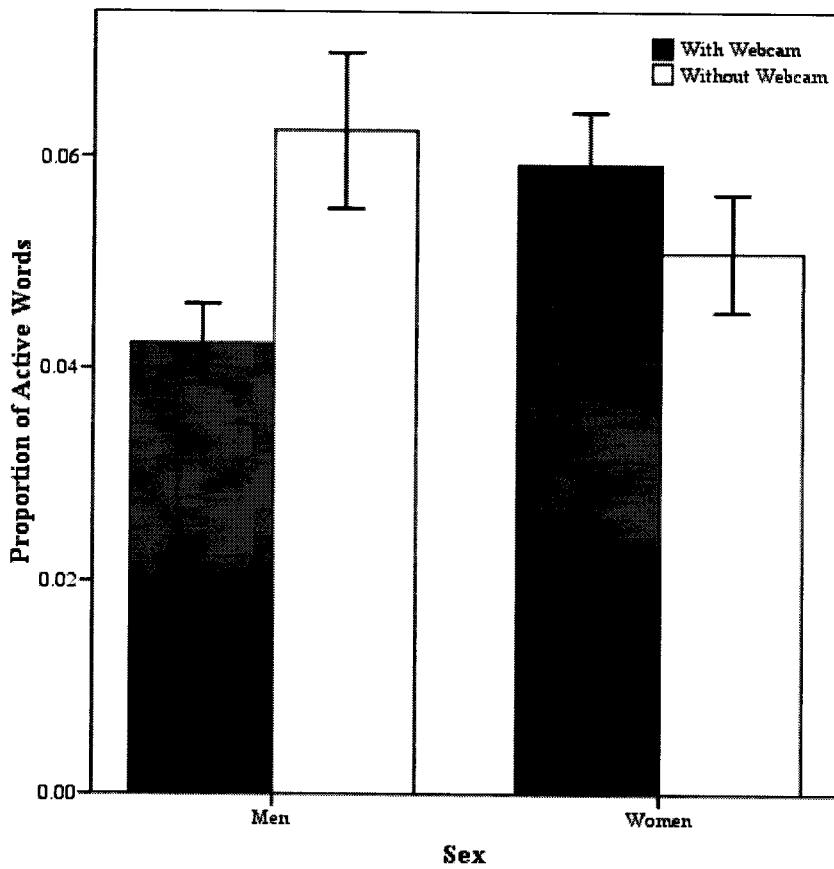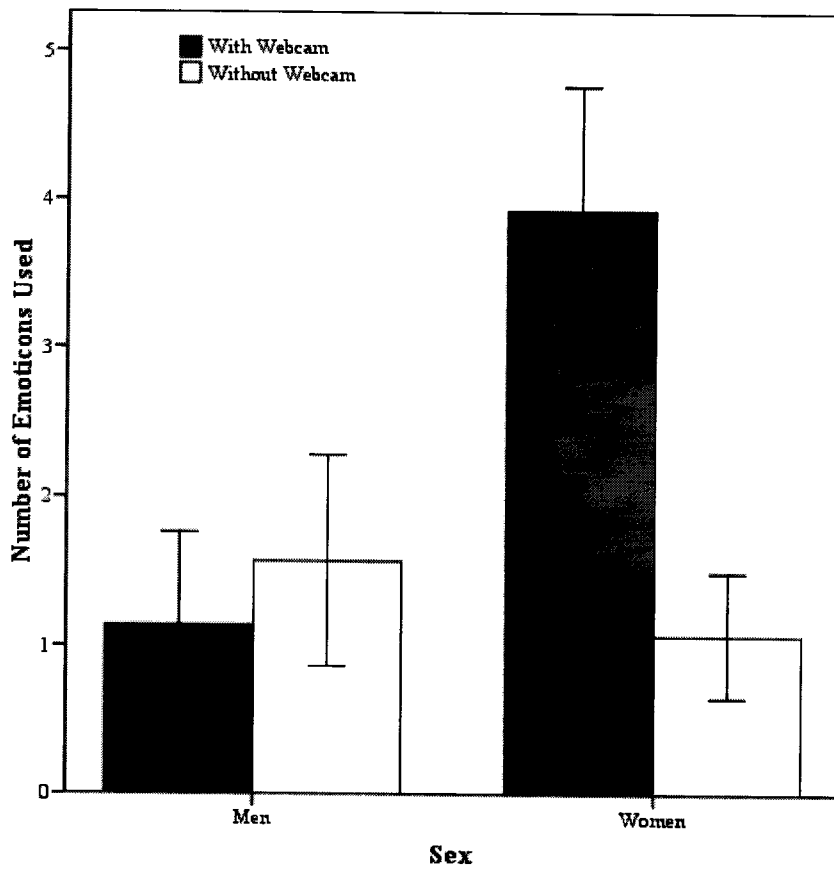
Figure 4.4.

Figure 4.5

Chapter 5

Are person by context interactions on computer-mediated social communication specific to situation? Influence of task demands

Study 5:

The effects of shyness and anonymity on social communicative behaviour during

social cooperative tasks: Does the difficulty of the task matter?

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Abstract

In a series of three studies (Studies 1, 2, and 3), the effects of shyness and visual anonymity on affective quality of language and other forms of social communicative behaviour during performance-related online conversation were assessed. Female participants were paired to form dyads and were instructed to complete a cooperative task within 10 minutes by communicating via an instant messenger on the Internet. The dyads were randomly assigned a visually anonymous (i.e., chatting without webcams) or visually non-anonymous (i.e., chatting with webcams). In Study 1, the cooperative task assigned was very difficult and was not completed by any of the dyads. Shyness was related to a greater proportion of sad words in the visually non-anonymous condition. In Study 2, the cooperative task assigned was easy and every dyad completed it in the allotted time. Shyness was related to a greater proportion of passive words used. In Study 3, an extreme group design (dyads were composed of a high shy and a low shy participant) was applied and participants engaged in an easy cooperative task. High shy participants in the without webcam condition had the highest proportion of passive words used, whereas the high shy participants in the webcam condition had the lowest. Findings suggest that task demands may be another important social contextual factor to consider in the shyness by context interaction influences on social communicative behaviour.

Introduction

Context is an influential predictor of behaviour. However, originally, psychologists focused primarily on personality to predict behaviour. Traits theorists (e.g., Gordon Allport and Raymond Cattell) argued that personality traits were stable across context as demonstrated by consistent behaviour patterns (Allport, 1927; 1931; Cattell, 1946). For behaviour patterns to be deemed consistent, they would have to be exhibited in a variety of situations (e.g. home, work, public settings). Unfortunately, this approach to the study of behaviour to the study of behaviour did not give much weight to influence of the characteristics of the social context in which the behaviour had taken place. Furthermore, the disregard of the predictive value of the social context also meant that the person-context interaction was not considered. Behaviour that could not be predicted solely by personality was viewed as evidence that personality was not stable.

In the 1970s, a new approach was developed when Bem and Allen (1974) suggested that some people engage in consistent behaviour across different situations, whereas others did not, thereby stressing the importance of the person-context interaction. Inconsistencies in behaviour was no longer viewed as support against the stability of personality, instead it demonstrated that not all personality traits were influenced by context in the same manner (Funder & Colvin, 1991).

The personality trait of shyness has been hypothesized as being particularly influenced by the person-context interaction. The defining characteristics of shyness (e.g., heighten self-preoccupation, high avoidance tendencies) have been primarily linked to behaviour in social interactions and situations (Fatis, 1983; Pilkonis, 1977). Non-shy

individuals should behave consistently across most social situations, whereas shy

individuals should react more strongly, as displayed in changes in behaviours, as a result

of differences in the social situations.

Brunet and Schmidt (2007; in press) recently tested that hypothesis by

manipulating the context of Internet conversations of female undergraduate participants

paired into dyads. The Internet is a remarkably useful tool in the investigating of person-

context interactions. By having participants interact via the Internet, we can control a

greater numbers of contextual cues ranging from visual cues (e.g., the attractiveness of

the conversation partner, the physical characteristic indicative of the sex of the

conversation partner, facial expressions) to auditory cues (e.g., voice tone, accent,

laughter). By using webcams, we were able to create an anonymous condition (i.e.,

participants chatted without webcams) and a non-anonymous condition (i.e., participants

chatted with webcams). We hypothesized a person-context interaction, more specifically

that shy individuals in the anonymous conditions would act bolder, whereas the shy

individuals in the non-anonymous condition would behave more like they typically

would during a face-to-face conversation. The non-shy individuals, we predicted would

behave consistently regardless of condition. For some types of behaviour, we found

support for the person-context interactions. Shy individuals disclose less personal

information in the anonymous condition compared to the non-anonymous condition,

whereas the disclosures of the non-participants were unaffected by the condition type

(Brunet & Schmidt, 2007; Brunet & Schmidt, in press). For other measures, we found

that shyness had an effect regardless of the condition. For example, shy individuals

started fewer topics during a conversation (Brunet & Schmidt, in press). The dyads that we formed were randomly assigned to either a webcam condition or a without webcam condition.

Here, we attempted to extend our previous findings by changing the general context of the conversation and social expectation. In our previous studies (Brunet & Schmidt, 2007; Brunet & Schmidt, in press), participants were in a situation in which the goal was to interact simply to learn more about one another in a free chat situation (i.e., mimicking a first social interaction). In the current study, the goal of the social interaction was to complete a social cooperation task.

Previous research has shown that shy individuals are particularly at risk to succumb to the pressures of performance-related situations. For example, it has been reported that shy children (Ludwig & Lazarus, 1983) and shy female adults (Arnold & Cheek, 1986) performed significantly worse on the Stroop Colour and Word Test compared to their peers. Arnold and Cheek (1986) found that in a post-test survey, shy individuals reported greater levels of worrying and test-irrelevant thinking. Given that the successful completion of the task required high levels of attention, shy individuals, splitting their focus between the task and worrying about how they were being perceived by the experimenters, was detrimental to their performance. Based on these findings, we conducted a series of three studies to investigate how the social context related to a shared performance task in visually anonymous and visually non-anonymous conditions would affect the social communicative behaviours of shy and non-shy individuals.

Study 1: Unselected female dyads, difficult task

As we demonstrated in our previous studies (Brunet & Schmidt, 2007; Brunet & Schmidt, in press), shy individuals behave bolder when interacting anonymously. Once visual cues are present, thereby eliminating anonymity, shy individuals reduce their bold behaviour. In Study 1, we explored the effects of anonymity during the completion of a difficult social cooperation task among shy individuals. We chose a difficult task to highlight the pressures that performance can have on shy individuals particularly in non-anonymous conditions

Method

Participants

Sixty female undergraduate students attending McMaster University, Ontario, Canada, volunteered for the study. Participants ranged in age from 17 to 23 years ($M =$ 19.23 years, $SD = 1.44$ years) and were not selected for any personality traits. All participants were recruited from a participant pool and received course credit as compensation for their time.

Apparatus

Two isolated testing rooms (one for each participant) were equipped with an Internet accessible laptop. For the non-anonymous condition, Creative NX Pro webcams was connected to laptops. The webcam were positioned to broadcast the entire head and face of the participants (image size was 320 X 240 pixels). Participants were able to send messages to one another via the Yahoo! Messenger program. This program

automatically saves all messages sent, thereby providing an accurate and time sensitive transcript of the conversation.

Materials

We created a puzzle task by dividing a black and white photograph into 10 rectangular pieces. Five pieces were randomly labelled A through E and pasted on sheet A, the remaining 5 pieces (labelled 1 to 5) on sheet B (see Appendices 5 & 6).

Procedure

We paired participants to form 30 dyads, which were then randomly assigned to the webcam (i.e. non-anonymous) or without webcam (i.e. anonymous) condition. To prevent interaction between the dyad members prior to the experiment, participants were scheduled to arrive 5 minutes apart. Each member of the dyad was escorted to one of the two isolated testing rooms. The participants did not physically meet one another at any point throughout the experiment. Dyads were first given 10 minutes to chat with one another with the instructions of getting to know one another.

Following this chat period, participants were separately given the same set of instructions regarding the cooperative puzzle task. One member received sheet A of the puzzle task and the other member sheet B. They were each instructed that they were to complete a cooperative puzzle task. By describing the pieces to one another, they would have to determine the order of the pieces to fit on a grid of 2 rows and 5 columns. Dyads in the webcam condition were specifically instructed that they were prohibited from showing their pieces on the webcam. Participants were given 10 minutes to attempt to complete the task, and were asked to indicate their answers on the blank grid provided.

After the 10 minutes expired, participants were asked to complete 5-highest loaded items (Bruch, Gorsky, Collins, & Berger, 1989) from the Cheek and Buss Shyness Scale (Cheek, 1983; Cheek & Buss, 1981). The psychometric properties of this widely-used measure are well established (Cheek & Buss, 1981; Bruch et al., 1989). For each item, participants provide a response from 0 (extremely uncharacteristic) to 4 (extremely characteristic).

Computer-mediated Measures and Coding

The transcripts were coding for three categories of measures. The traditional linguistic measures and the Internet specific measures were coded using Microsoft Excel ©. The Affect in language measures were coded using the Dictionary of Affect computer software[4].

Traditional Linguistic Measures. There are six measures that comprise this category: total word count, total number of turns, mean word count per turn, double turns, first person pronouns, and second person pronouns. *Total word count* is defined as the number of words that each participant typed and sent throughout the 10-minute task period. Likewise, the *total number of turns* is how many turns (i.e. messages sent to partner) that the participant took during the task. The *mean word count per turn* is the average number of words that the participants used per message sent. This score was calculated by dividing the total word count score by the total number of turns score. The number of *first person pronouns* (e.g. I, me, my, myself) and *second person pronouns*

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[4] Coding was performed by Dr. Cynthia Whissell, professor in the Department of Psychology at Laurentian University.

(e.g. you, your, yours, yourself, ur, u) were separately computed to form a score for each category of pronouns.

Internet-Specific Communication Measures. There are two types of linguistic behaviours that have emerged in Internet conversations to convey tone (i.e., emoticons) or to reduce typing time (i.e., Internet-specific lexis, more generally known as net lingo). *Emoticons* were originally groupings of keyboard characters to represent facial expressions, but are now displayed as small yellow face graphics (e.g., ☹ sad face) in the messages. We coded the transcripts to obtain a score of the total number of emoticons that each participant used during the task. Internet-specific lexis words (e.g., "ur" for your, see Jansen 2005, for an exhaustive list) are abbreviations for words or phrases that are commonly used by during online conversations and email messages. We created two types of categorize for these words, *action* words (e.g., "lol" for laugh out loud) and *non-action* words (e.g., "imo" for in my opinion). A score for each category was computed for each participant representing the number of each type they used during the conversation.

Affect in Language Measures. The Dictionary of Affect computer program has been designed to code the affective value of the words in transcripts (reliability and validity are reported in Whissell, Fournier, Pelland & Werr, 1986). One third of a million words have been rated on the dimensions of activation and pleasantness. From these two dimensions, eight categories of words have been established (Whissell, 1999): *pleasant* words (high in pleasantness, neutral in activation), *unpleasant* (low in pleasantness, neutral in activation), *active* (neutral in pleasantness, high in activation), passive (neutral

in pleasantness, low in activation), *fun* (high in pleasantness and in activation), *nice* (high in pleasantness, low in activation), *nasty* (low in pleasantness, high in activation), and *sad* (low in pleasantness and in activation). Furthermore, an *overall activation score* (words high in activation regardless of scores on the pleasantness dimensions) and an *overall pleasantness score* (words high in pleasantness regardless of scores on the activation scale). A final category of *imagery* is calculated which is the use of abstract words (e.g., compassion, before) compared to concrete words (e.g., bird, hand).

Data Analyses

Following procedures by Cook and Kenny (Cook & Kenny, 2005; Kenny, 2004), mixed linear models were used to analyze the data.

Results

Affective Language Measures

The analysis revealed a statistically significant Actor's Shyness X Webcam condition interaction on the usage of sad words [$F(1, 53.23) = 4.60, p = .037$]. Participants with the highest scores of shyness who were in the webcam condition used more sad words than all the other participants. The high shy participants in the without webcam condition used fewest sad words than all other participants. The participants who scored low on shyness were consistent across condition in the use of sad words (see Figure 5.1).

In addition, there was a nearly statistically significant Actor's Shyness X Webcam condition interaction on the overall activation of words used [$F(1, 54.98) = 3.96, p = .052$]. In the no webcam condition, higher shyness was associated with an increase in

usage of words with high overall activation [$\beta = .003, r = .315, p = .090$]. In the webcam condition, no such relation existed [$\beta = -.001, r = .208, p = .269$].

There was a trend of Partner's Shyness to influence the actor's use of unpleasant words [$F(1, 53.54) = 3.48, p = .068$]. Actors used fewer unpleasant words when paired with participants who had high shyness scores.

Traditional Linguistic and Internet Specific Measures

There were no statistically significant main effects or interactions for the traditional or Internet specific measures. There was, however, a trend of Partner's Shyness on second person pronoun use [$F(1, 53.23) = 3.62, p = .062$]. Higher Partner's Shyness scores were associated with Actors using fewer second person pronouns.

Discussion

Based on the findings of Study 1, it would appear that during a difficult task, the person-context interaction of shyness-anonymity does not significantly influence behaviour with one exception. Shyness was related to a greater proportion of sad words written in the non-anonymous condition (i.e., presence of a webcam), whereas the opposite was true in the anonymous condition (i.e., absence of a webcam). These patterns could suggest that the pressures of doing a difficult task coupled with being seen and seeing the dyad partner contributed to a stronger negative reaction in shyer individuals as expressed by their using more sad words. In the anonymous condition, there was still the pressure of the difficult task, but the shyer participants may have felt relieved that there were at least no visual cues, which resulted in them using sad words

less than everyone else. As predicted, the individuals who scored low on shyness seemed unaffected by the context of anonymity.

Study 2: Unselected females dyads, easy task

With Study 2, we found that the effects of the shyness-anonymity interaction to be minimal. One possible reason was that the task difficulty was so great that it affected everyone equally and did not allow for any other individual differences to influence behaviour. To assess the accuracy of that hypothesis, we ran a similar study with another unselected sample of undergraduate female students. However, the cooperative task of Study 2 was much easier and doable within the time constraint given. We hypothesized that with an easier task, the pressures of doing a task would still apply to the shyer individuals, but that the low participants would no longer be affected by it. Therefore, we expected greater person-context interactions.

Method

Participants

Participants were undergraduate female students ($N = 28$) from McMaster University ranging in age from 18 to 24 years ($M = 20.68$ years, $SD = 1.72$ years). Participants were not pre-selected for personality traits. All participants were recruited from the undergraduate participant pool and received course credit in their undergraduate course.

Apparatus

The same equipment and room setup from Study 1 was used for this follow up study.

Materials

The cooperative task for this study was matching up a set of eight tangrams previously rated (Hupet, Seron, & Chantraine, 1991) as high in codability (i.e., easy to describe with words) and low in discriminability (i.e., difficult to differentiate one from the others).[5] The tangrams were positioned into 2 columns on a sheet. Two random orders were created, one for each member of the dyad. Next to each tangram was an empty square to record their responses (see Appendices 7 & 8).

Procedure

The same general procedure from Study 1 was applied to this study. The only exception was the specific instructions give to the participants. They were informed that they had to label the images from 1 to 8 with the condition that both members needed to have the same order. By describing the images they would be able to determine how their images matched and assign numbers to establish the same order.

Computer-mediated Measures and Coding

The transcripts were coded for the same measures as described in Study 1.

Results

Affective Language Measures

The analysis revealed a statistically significant Actor's Shyness X Webcam Condition (see Figure 5.2) interaction on the proportion of passive words used [$F(1, 20.72) = 7.34, p = .013$]. In the webcam condition, higher scores of shyness was statistically significantly predictive of higher proportion of passive words used [$\beta = -.008$,

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[5] Tangram images were borrowed with permission from Michel Hupet, Department of Psychology, University of Louvain.

$r = .696, p = .012$], but not in the without webcam condition [$\beta = .001, r = .096, p = .724$].

A second statistically significant interaction was noted for Actor's Shyness X Webcam Condition interaction on the fun words used [$F(1, 17.32) = 7.49, p = .014$]. However, the score of one participant was considerably higher than the others ($Z = 3.52$). When the analysis was run without the dyad with that individual, there was no longer a statistically significant interaction, but there was a statistically significant main effect of shyness [$F(1, 21.03) = 5.03, p = .036$]. Individuals with higher scores of shyness used less fun words (see Figure 5.3).

There was also a trend of Partner's Shyness on unpleasant words used [$F(1, 20.70) = 3.07, p = .094$]. The higher the partner's shyness was, the less likely participants used unpleasant words.

Traditional Linguistic Measures

For Actor's total number of words used during the task, there was a nearly statistically significant Actor's Shyness X Webcam Condition interaction [$F(1, 21.60) = 4.27, p = .051$]. There was a slight increase in the number of words used for participants with higher scores of shyness in the webcam condition, and a slight decrease in the without webcam condition.

Internet Specific Measures

There were no statistically significant main or interaction effects for the Internet specific measures.

Discussion

As predicted, with an easier task, more person-context interactions were highlighted. For example, shyer participants used a higher proportion of passive words than their low shy counterparts, but only in the webcam condition. Their word choice could be reflecting their overall demeanour. Shyness has been previously linked to passiveness, avoidance of leadership roles, and avoiding speakership during conversations (Garcia, Stinson, Ickes, Bissonnette, & Briggs, 1991; Pilkonis, 1977; Thompson & Rapee, 2002). During the non-anonymous condition, their self-evaluation is heightened, and consequently, they would rather not draw focus to themselves. They may be using more passive words as strategy to pass the leadership to their partner.

The shyer individuals using less fun words (i.e., high in activation and in pleasantness) could also be indicative of their attitudes towards the task. Given previous research demonstrated that shy individuals were worried during performance tasks (Arnold & Cheek, 1986), it would be reasonable to assume that the shy individuals do not perceive this cooperative task as being a pleasant experience, despite the task being easy. The participant who scored low on shyness on the other hand may have felt relaxed during the easy task, which resulted in a greater use of fun words.

Study 3: Selected female dyads, easy task

In the Studies 1 and 2, we used an unselected sample of participants. We wanted to extend those findings by recruiting participants who were high or low in shyness. By doing so, we could control the dyadic composition by having shy individuals paired only with low shy individuals. The control of this additional contextual cue (i.e., quality of the

partner) could provide greater precision in the understanding of the shyness-anonymity interaction during a performance task.

Method

Participants

Twenty-eight participants (range 18 to 24 years, $M = 21.43$ years, $SD = 1.76$ years) were selected from a larger sample of 520 female undergraduate students (age ranged from 17 to 38 years, $M = 20.70$ years, $SD = 2.40$ years). Recruited from McMaster University's student centre, the larger sample completed a series of test including the Cheek and Buss (1981) Shyness and Sociability scales. Participants who fell +/- 1 SD on the shyness score were contacted to participate in a follow-up laboratory study. The 28 students who agreed to participate in the laboratory study received $10 as compensation for their time.

Computer-mediated Measures and Coding

The transcripts were coded for the same measures as described in Study 1 and 2

Results

Affective Language Measures

The analysis revealed no statistically significant main or interaction effects for the affective language measures. However, an Actor's Shyness X Webcam condition interaction approached significance on the proportion of passive words used [$F (1, 12) = 4.31, p = .060$]. High shy participants in the without webcam condition had the highest proportion of passive words used, whereas the high shy participants in the webcam condition had the lowest.

Traditional Linguistic Measures

There were no statistically significant main or interaction effects for the traditional linguistic measures. There was a trend of Actor's Shyness X Webcam condition interaction on the number of first person pronouns used [F (1, 12) = 3.87, p = .073].

Internet Specific Measures

There were no statistically significant main or interaction effects.

Discussion

Contrary to our prediction, using a selected sample did not highlight the shyness-anonymity interaction during an easy task. Instead, the effects that we found in the unselected sample were either reduced to trends (e.g., the shyness-anonymity interaction on passive word use) or eliminated completely (e.g., the main effect of shyness on the use of fun words). The analyses used were somewhat different compared to the two previous studies. In the previous studies, shyness was treated as a continuous variable, but in the analyses for the selected sample, shyness was treated as a dichotomous variable. Participants were either in the high shy or low shy group. The lack of statistically significant findings could demonstrate that greater precision is obtained from person-context interaction when the person variable is a continuous measure.

General Discussion

When examining person-context interactions during performance tasks, specifically when investigating the moderating effects of anonymity on the influence of shyness on social communicative behaviour, the difficulty of the task needs to be

considered. Task difficulty is another element of the context. Within the difficult or easy task setting, the shyness-anonymity interaction revealed different patterns of word choices. For the shyer individuals, the non-anonymous condition elicited a higher proportion of sad words used during the difficult task (Study 1) and of passive words during the easy task (Studies 2 and 3) compared to their counterparts in the anonymous condition. Conversely, regardless if they are doing a difficult or easy task, the individuals low in shyness are not affected by anonymity. Prior research has demonstrated that shy individuals worry about tasks more than non-shy individuals (Arnold & Buss, 1986). This worry could manifest in the word choice of the shyer participants. Furthermore, it has been shown that shy individuals report more evaluation apprehension and dissatisfaction with group tasks (Bradshaw, Stasson, & Alexander, 1999). Therefore, during a task with no chance of success, the shyer individuals in the non-anonymous conditions were using more sad words possibly because they felt sadder in the moment compared to the other participants. This task anxiety can possibly explain some of the findings of these studies; however, we never asked or measured task anxiety. Consequently, in follow-up studies, their task anxiety should be measured to explore how it affects communicative behaviour and affective quality of language.

Similarly, the greater use of passive words by shyer individuals in a non-anonymous condition during the easy task could be reflective of their tendency to let others lead during group tasks (Bradshaw & Stasson, 1998). When in an anonymous condition, they were more likely feeling bolder and did not need to revert to their passive nature. A limitation of the studies was that the participants were not asked to complete a

mood questionnaire after completing the task. Therefore, we cannot state with certainty that the affective content of their word choice was representative of their mood state. The relation between mood state and the affective content of their word choice would need to be established through subsequent studies designed specifically to assess this relation.

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Figure Captions

Figure 5.1. During the difficult task, as Actor's Shyness increased, the proportion of sad words used increased but only in the webcam condition. Without the webcam, the proportion of sad words decreased as Actor's Shyness increased.

Figure 5.2. During the easy task, the proportion of passive words used decreased as Actor's Shyness increased but only during the webcam condition. Without the webcam, Actor's Shyness was not related to the proportion of passive words used.

Figure 5.3. During the easy task, the proportion of fun words used decreased as Actor's Shyness increased regardless of webcam condition.
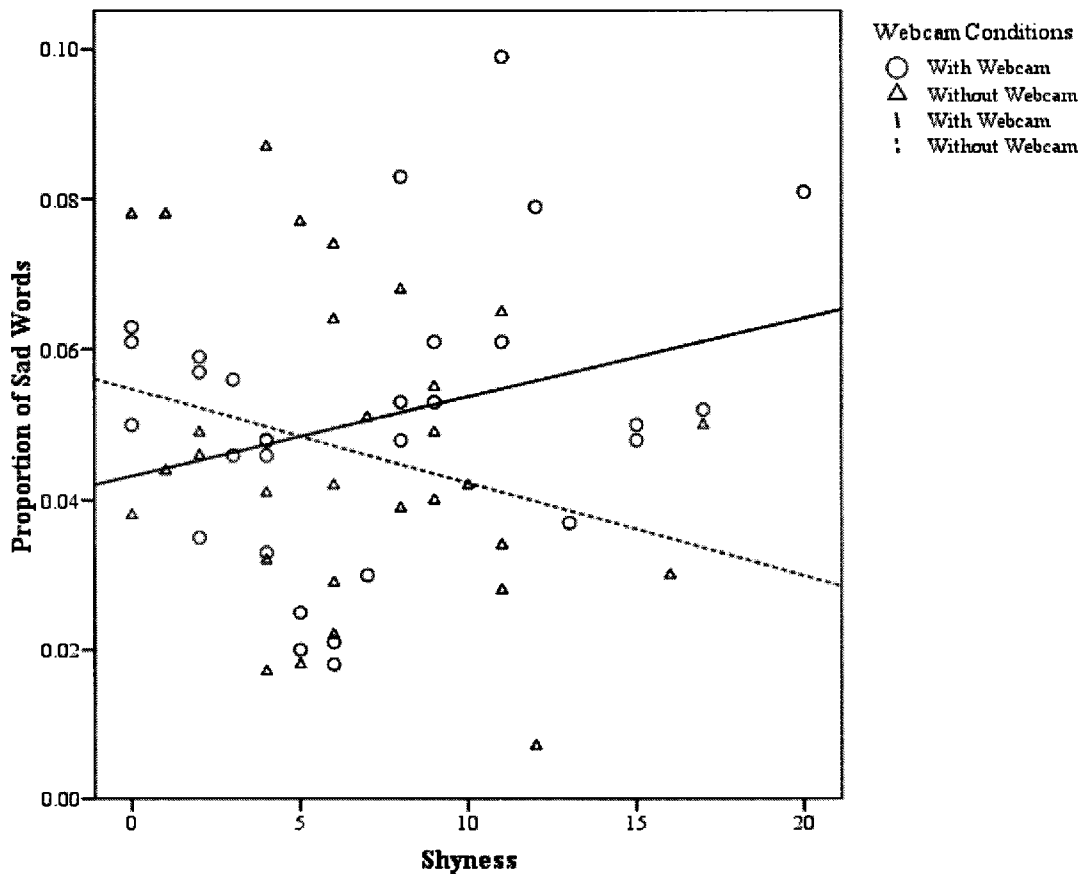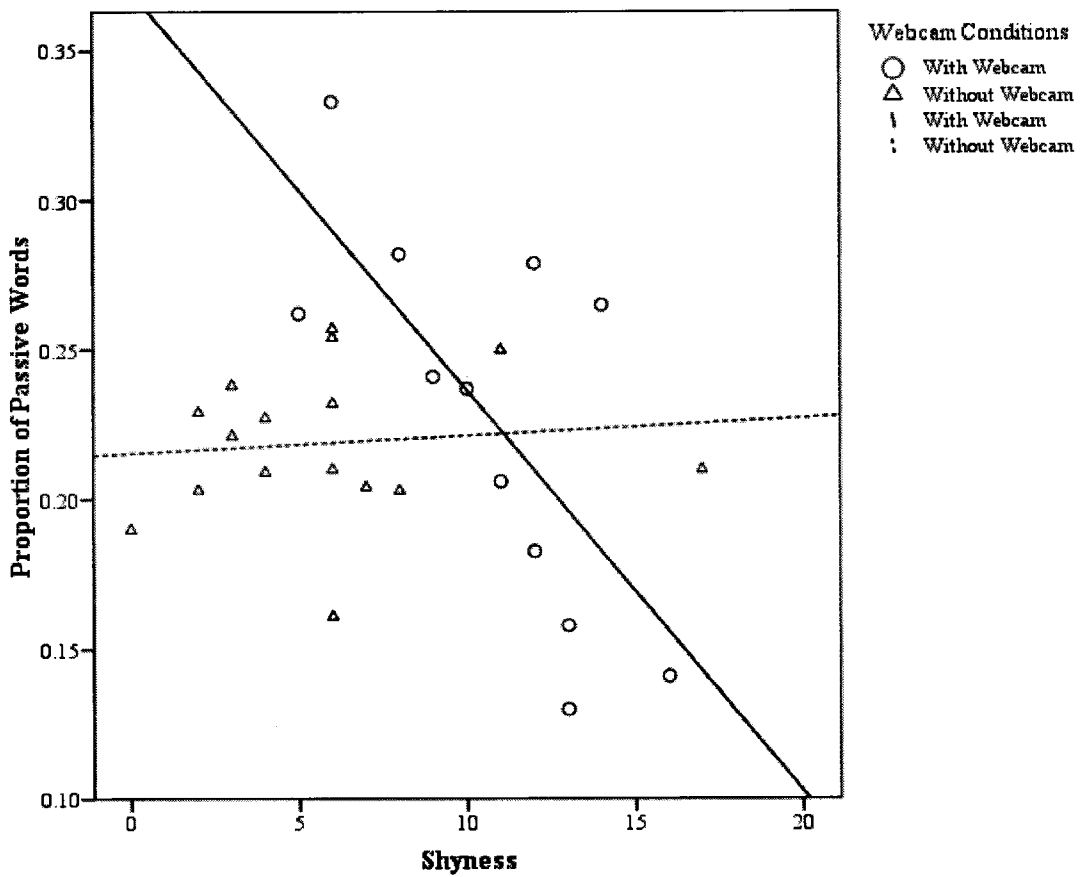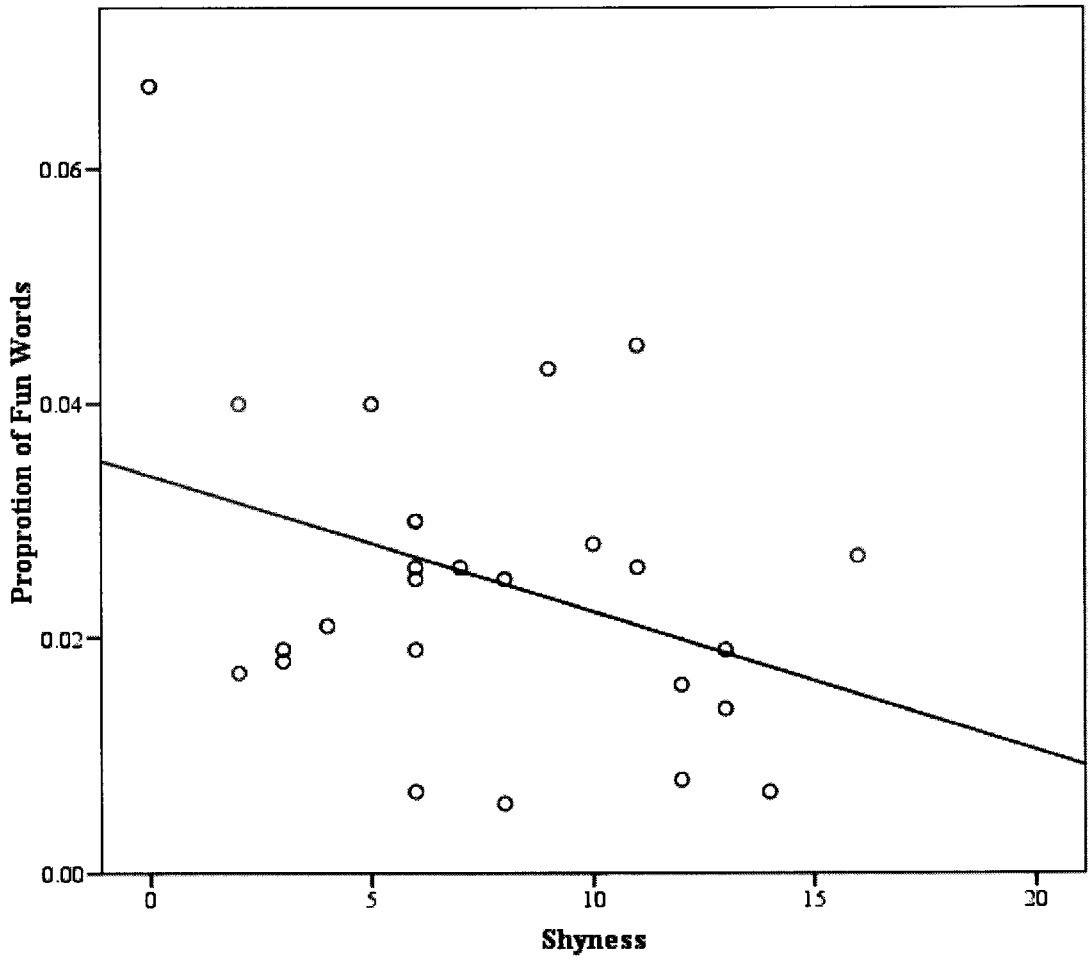
Figure 5.1.

Figure 5.2.

Figure 5.3.

Chapter 6

General Discussion and Conclusions

The characteristics of the person (Allport, 1927; 1931; Allport & Allport, 1921; Cattell, 1946), and the characteristics of the situation, are thought to be the best predictors of social communicative behaviour (Murphy, 1947). Yet neither one, on their own, has been as a strong of predictor as a combined model taking into account both the person and the situation. Consequently, it has been proposed that situational factors influence people differently based on their individual differences (e.g., personality traits, sex; Bem & Allen, 1974). The interactive effects of the characteristics of the person and of the situational factors have been termed the "person-context interaction". To fully understand behaviour and personality, the person-context interaction must not only be considered, but must be studied in a precise manner to determine which contextual cues interact with which personality characteristics.

In this dissertation, the focus has been on examining how the person-context interaction affects social communicative behaviour. There are certain characteristics of a person that are highly relevant to social communicative behaviour. Shyness, for example, is a personality trait that by definition is related to difficulties with social interactions. The heightened evaluation apprehension that shy individuals experience during social interactions leads to the avoidance of social interactions and inhibited behaviour during these interactions. It has been hypothesized that shy individuals would exhibit less inhibited behaviours in social situations with increased anonymity (Roberts et al., 2000). By applying the concept of person-context interactions, I developed a research program to explore how shyness and anonymity interact to determine social communicative behaviour during dyadic computer-mediated conversations. In all five of

the studies presented in the dissertation, participants were paired into dyads, which were randomly assigned to a condition with a webcam or without a webcam. The presence or absence of the webcam was a manipulation of visual anonymity.

This research program was designed around four goals. To examine: 1) the shyness-context interaction, 2) anonymity as a context, 3) if the effects of shyness-anonymity were specific to shyness or generalizable to other person-anonymity interactions, and 4) the Internet as a research tool in the study of person-context interactions. From these goals, three broad research questions were developed. Each research question was addressed in one of the chapters presented in the dissertation.

1) Are the effects of shyness on social communicative behaviour context specific?

Yes and no, the findings of Studies 1 and 2 (presented in Chapter 3) demonstrated that anonymity does moderate the effects of shyness on some forms of social communicative behaviour but not all. For example, in both studies, it was found that shy individuals self-disclosed more freely when visual cues were absent thereby creating anonymity. However, when visual cues were present, the shy individuals demonstrated their inhibition by self-disclosing less frequently. The self-disclosure of non-shy or low shy individuals was unaffected by the presence or absence of visual cues. In other words, anonymity only affected high shy individuals, not the low shy individuals. Therefore, for self-disclosure, the effects of shyness are context specific. However, for other forms of social communicative behaviour, the effects of shyness are not context specific. For example, in the Study 2 in which participants were selected for high or low scores on the shyness measure and 20 minutes chat duration, the high shy participants initiated fewer

topics than the low shy participants across both the anonymous and non-anonymous condition. Likewise, they used proportionally fewer "fun" words (i.e., words high in activation and in pleasantness) across both conditions. For these forms of social communicative behaviour, the effects of shyness were consistent across context (i.e., visual anonymity vs. visual non-anonymity).

Two main conclusions can be made from these findings; one theoretical and one practical. The theoretical implication is that the findings of Studies 1 and 2 support the assumption that shy individuals will behave more boldly in social settings with increased anonymity. However, only some forms of social communicative behaviour (e.g., self-disclosure) benefit from anonymity, other forms (e.g., starting new topics of conversation) do not. On the practical side, when examining the effects of shyness on social communicative behaviour, the level of anonymity associated with the setting must be considered. The level of anonymity of a social interaction can possibly explain statistically significant differences in the social communicative behaviour, or lack thereof, of high shy and low shy individuals

2) Are person by context interactions on computer-mediated social communication specific to shyness?

In Studies 3 and 4 presented in Chapter 4, the moderating effects of anonymity (i.e., webcam vs. no webcam) on the influence of additional person characteristics (e.g., self-esteem, loneliness, and sex) on social communicative behaviour during dyadic computer-mediated conversations were examined. Similarly to the shyness-anonymity interaction effects, I found that anonymity moderated the influence of other person

characteristics for some forms of social communicative behaviour, but not for others. However, the exact effects of the shyness-anonymity interaction were not found with the other person characteristics studied. The effects of self-esteem were the most similar to shyness. For example, for both shyness and self-esteem, there was an interactional effect on self-disclosure. However, the pattern was not the same. For high shy individuals, visual anonymity allowed them to match the number of self-disclosures made by their low shy counterparts. Conversely, the individuals with low self-esteem in the visually anonymous condition actually surpassed the self-disclosure of the individuals with high self-esteem from both the visually anonymous and non-anonymous conditions.

For loneliness, anonymity had no moderating influence. All effects of loneliness on social communicative behaviour (e.g., proportion of nice words used) were consistent across the anonymous and non-anonymous conditions. Loneliness as a construct does not have an evaluative component, but both shyness and self-esteem do, which could possibly explain why anonymity did not moderate the influence of loneliness but did moderate the influence of shyness and self-esteem. When men and women were compared, anonymity did moderate the effects, but on forms of social communicative behaviour that were not influenced by shyness, self-esteem, or loneliness (e.g., emoticons used, reply questions asked). Consequently, the findings of the moderating effects of anonymity on the influence of each characteristic of the person (e.g., self-esteem, loneliness, and sex) on social communicative behaviour presented in Chapter 4 demonstrated a unique pattern specific to each characteristic. Additionally, none of these patterns overlapped with the effects of the shyness-anonymity interaction. Therefore, the

effects of shyness and anonymity found in Studies 1 and 2 cannot be generalized to other

personality characteristics including other characteristics (e.g., self-esteem and

loneliness) that are associated with problematic social communicative behaviour.

Shyness, self-esteem, loneliness, and sex are all distinct characteristics of the person.

Each contributes to social communicative behaviour in a unique way.

3) Are person by context interactions on computer-mediated social communication

specific to situation?

The final research question was addressed in Study 5 presented in Chapter 5. By

analyzing the social communicative behaviour during performance related social

interactions, it was evident that the effects of shyness-anonymity on behaviour patterns in

regular social interaction did not generalize to performance related social cooperation.

During a difficult task (i.e., cooperative task that none of the dyads managed to

complete), the shyness-anonymity interaction only influenced the proportion of sad

words used. Shy individuals used more sad words during the non-anonymous condition,

and less during the anonymous condition. This effect on sad words was not previously

found when examining the social communicative behaviour during regular social

interactions. During an easy task (i.e., cooperative task that dyads finished successfully

in the allotted time), most of the effects (e.g., shyness-anonymity interaction effect on

proportion of passive words used) were not the same with one notable exception: fun

words. In both the regular social interaction and in the easy performance related social

interaction, shy individuals had a lower proportion of fun words (i.e., high in both

activation and pleasantness) regardless of anonymity. This exception was not a shyness-

anonymity interaction effect, it was solely an effect of shyness. Therefore, the only consistency between a regular social interaction and a performance related social interaction is a main effect of shyness. These findings demonstrate that the nature of the conversation (typical social conversation vs. performance related conversation) is an important contextual cue to consider when examining shyness-anonymity interaction on social communicative behaviour.

Implications

     Theoretical Implications. The current research on shyness and the Internet has focused on self-reported measures. High shy individuals report feeling more at ease during online conversations (Amichai-Hamburger, Wainapel, & Fox, 2002; Hamburger & Ben-Artzi, 2000) and reported feeling more involved in online relationships (Ward & Tracey, 2004) than face-to-face conversations and relationships. In another survey-study, high shy individuals reported that they self-disclosed more information online than face-to-face (Stritzke, Nguyen, & Durkin, 2004). The findings presented in this dissertation significantly contribute to the research on shyness and the Internet because it has moved the research from self-reports to direct behavioural observations. For example, the findings from Studies 1 and 2, that high shy individual make more self-disclosures in a visually anonymous chat condition, support and extend the previous self-reported research conducted by Stritzke et al. (2004). From the results from Studies 1 and 2, we now have behavioural data to support the previously self-reported finding that high shy individuals self-disclose more online. However, more interestingly, the increase in self-disclosure is not found in every online condition. High shy individuals need a visually

anonymous condition to be able to self-disclose more. If that visual anonymity is compromised (i.e., dyadic partners are able to see one another via webcams), high shy individuals make fewer self-disclosures than their low shy peers. The studies presented in the dissertation are the first step in what should be the next stage of shyness and Internet research; moving from self-reports to controlled laboratory experiments and behavioural observations.

Not only should controlled laboratory experiments be used to examine the interactional effects of shyness and anonymity on social communicative behaviour, the same should be done to investigate the self-esteem by anonymity interactions. The results from study 3 demonstrated that during online conversation individuals low in self-esteem either match individuals high in self-esteem (webcam condition) or surpass them (no webcam condition) in the number of prompted self-disclosures made. This finding supports previous suggestions that individuals with low self-esteem would find the Internet as an appealing medium of communication (Caplan, 2002; 2003) especially when anonymity is high.

Another theoretical implication is that visual anonymity does not influence the effects of loneliness on social communicative behaviour. Loneliness does affect social communicative behaviour (e.g., lonelier participants volunteered less information about themselves), but this effect was regardless of the webcam's presence or absence. Given that visual anonymity does not interact with loneliness on social communicative behaviour, it would suggest that loneliness was not associated with self-presentation or

heightened self-preoccupation during social interactions. Loneliness was, therefore, unique in that respect in comparison to self-esteem and shyness.

Clinical Implications. Greco and Morris (2001) reported that shy individuals were capable of proper social skills but that the anxiety they experience during social interactions prevents them from competently applying their social skills. Consequently, they suggest that Social Skills Training programs are not always effective with shy individuals because they do not help them manage their anxiety. The findings of the research program presented in this dissertation support this idea. High shy individuals can self-disclose as much as their low shy peers in an anonymous setting. Intervention treatments programs should not focus solely on teaching high shy individuals how to self-disclose among other forms of social skills, because they already are capable of engaging in this behaviour. Instead, treatment plans should be designed to follow a progressive stage program; gradually moving from a highly anonymous setting to a typical non-anonymous face-to-face setting. This type of program would allow high shy individuals to learn to transfer the social communicative behaviour that they already do in anonymous settings to other settings. Similar programs can also be developed for individuals low in self-esteem, but not for individuals high in loneliness.

Limitations and Future Directions

With the exception of the sex difference paper (Study 4), the research participants were all female. Accordingly, the research findings, and any intervention treatment programs developed from these findings, cannot be reliably applied to men. Similar studies with male participants would need to be conducted to determine if high shy males

benefit from visual anonymity in the same way that high shy females do. Most likely, the findings of a male study would provide additional support to the benefits of the described intervention treatment program. However, there may need to be small modifications between the female and male treatment program.

The age of the participants must also be considered before generalizing the findings of the research program. The participants were all in their late teens to early 20s, and therefore grew up with computers and the Internet as easily accessible technology. Older individuals for whom the Internet was not yet established during their childhood and adolescence may not be able to communicate as effectively online as did the younger cohort. Their unfamiliarity with communicating via this new medium may override the benefits that anonymity may provide high shy older adult. To fully assess the benefits to older adults, a study with shyness and attitude towards CMC as independent variables would need to be conducted. These results would inform whether treatment programs for shyness should be tailored to the age of the individual.

Finally, the familiarity between dyadic partners could possibly influence the interactional effects of shyness and anonymity on social communicative behaviour. In the research presented, familiarity was not manipulated; dyadic partners were unfamiliar with one another. This unfamiliarity could possibly have increased the already heightened self-consciousness experienced by shy individuals in the visually non-anonymous condition. In a follow-up study with dyads composed of 1) strangers, 2) acquaintances, and 3) close friends, the moderating effects of familiarity can be

investigated. Most likely, as familiarity increases, the benefits of anonymity will

decrease.

Conclusions

Four goals were proposed for this research program. The first three goals, 1) the

examination the shyness-context interaction, 2) the investigation of anonymity as a

context influencing social communication behaviour, and 3) the investigation of the

specificity of shyness-anonymity interaction or its generalizability to other person

characteristics were represented in the three research questions. From these three goals

and three research questions, three main conclusions can be made. First, the social

communicative behaviour of individuals high in shyness is more likely to be affected by

changes in anonymity. More specifically, high shy individuals behave more boldly (e.g.,

greater self-disclosure) in settings with visual anonymity. However, for some forms of

social communicative behaviour (e.g., initiating topics of conversation), the detrimental

effects of shyness cannot be minimized despite visual anonymity. Second, anonymity is

a contextual cue that affects social communicative behaviour. The effects of shyness,

self-esteem, and sex were all moderated by differences in anonymity (i.e., visually

anonymous vs. visually non-anonymous). Only loneliness was unaffected by differences

in anonymity. Lastly, the effects of one person-context interaction (e.g., shyness-

anonymity) cannot be generalized to other person characteristics (e.g., self-esteem,

loneliness, and sex). Each person characteristic is moderated by anonymity to result in a

unique pattern of social communicative behaviour.

In addition to investigating and answering the three research questions proposed. The studies presented in this dissertation also addressed a methodological issue (i.e., fourth goal). The Internet is a widely used medium of social communication. Its role in the social development and social life of individuals has not gone unnoticed by psychologists and sociologists among many other disciplines. However, using the Internet as a laboratory tool to conduct a controlled experiment has yet to become widely popular among researchers. There have been studies in which the Internet has been successfully as a laboratory tool (e.g., Joinson, 2001). Yet, researchers have not used it to investigate the person-context interaction as it applies to shyness or other personality traits. The findings in the studies presented in this dissertation demonstrate that the Internet can be effectively used to create conditions by allowing for control over many contextual cues. By using the Internet as a laboratory tool, I was able to isolate the effects of the shyness-anonymity interaction on specific forms of social communicative behaviour.

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Appendix 1.

Internet activity questionnaire used in each study

Your age: _____

Sex: Male or Female

School level: 1st year, 2nd year, 3rd year, or 4th year

Program of study : _____

Do you have experience chatting online in English? Yes   or   No

Approximately, how many hours a week do you use instant messengers (MSN messenger, Yahoo! Messenger, ICQ, etc)? _____

How many instant messengers to you use on a regular basis? _____

How many hours a week do you chat in chatrooms? _____

How many people on your "buddy list" are people you know in person (provide a number, not a percentage)? _____

How many people on your "buddy list" are people you have only met online (provide a number, not a percentage)? _____

On a scale of 1 to 7 (1 being low, 7 being high), how comfortable are you using online communication?
1   2   3   4   5   6   7

Approximately, how many emails do you send out per week? _____

Appendix 2.

Cheek & Buss Shyness and Sociability Scales used in Chapter 1 (Study 1, 2), and

Chapter 5 (Study 5).

Directions: For each of the items below, please <u>circle</u> how characteristic or atypical the statement is of you using the following scale: 0 = Not at all characteristic, 1 = Slightly characteristic, 2 = Moderately characteristic, 3 = Very characteristic, 4 = Extremely characteristic.

1. I find it hard to talk to strangers. 0   1   2   3   4
2. When I'm in a group of people,
    I have trouble thinking of the right things to talk about. 0   1   2   3   4
3. I feel nervous when speaking to someone of authority. 0   1   2   3   4
4. I feel inhibited in social situations. 0   1   2   3   4
5. It takes me a long to overcome my shyness in new situations.................0   1   2   3   4
6. I like to be with people. 0   1   2   3   4
7. I welcome the opportunity to mix with people. 0   1   2   3   4
8. I prefer working with others rather than alone..0   1   2   3   4
9. I find people more stimulating that anything else......................................0   1   2   3   4
10. I'd be unhappy if I were prevented from making many social contacts...0   1   2   3   4

Appendix 3.

Coopersmith Self-Esteem Scale used in Chapter 4 (Study 3).

Directions: If a statement given below describes how you usually feel, put an X in the column "LIKE ME". If it does not describe how you usually feel put an X in the column "UNLIKE ME".

Like   Unlike
Me   Me

___ ___ 1. Things usually don't bother me.

___ ___ 2. I find it very hard to talk in front of a group.

___ ___ 3. There are lots of things about myself that I'd change if I could.

___ ___ 4. I can make up my mind without too much trouble.

___ ___ 5. I'm a lot of fun to be with.

___ ___ 6. I get upset easily at home.

___ ___ 7. It takes me a long time to get used to anything new.

___ ___ 8. I'm popular with persons my own age.

___ ___ 9. My family usually consider my feelings.

___ ___ 10. I give up very easily.

___ ___ 11. My family expects too much from me.

___ ___ 12. It's pretty tough to be me.

___ ___ 13. Things are all mixed up in my life.

___ ___ 14. People usually follow my ideas.

___ ___ 15. I have a low opinion of myself.

___ ___ 16. There are many times when I would like to leave home.

___ ___ 17. I often feel upset with my work.

___ ___ 18. I'm not as nice looking as most people.

___ ___ 19. If I have something to say, I usually say it.

___ ___ 20. My family understands me.

___ ___ 21. Most people are better liked than I am.

___ ___ 22. I usually feel as if my family is punishing me.

___ ___ 23. I often get discouraged with what I am doing.

___ ___ 24. I often wish I were someone else.

___ ___ 25. I can't be depended on.

Appendix 4.

Revised UCLA Loneliness Scale used in Chapter 4 (Study 3).

Directions: Indicate how often you feel the way described in each of the following
statements. <u>CIRCLE</u> one number for each.
1= No at all characteristic,
2= Rarely characteristic,
3= Sometimes characteristic,
4= Very characteristic.

No.	Statement				
1.	I feel in tune with people around me.	1	2	3	4
2.	I lack companionship.	1	2	3	4
3.	There is no one I can turn to.	1	2	3	4
4.	I do not feel alone.	1	2	3	4
5.	I feel part of a group of friends.	1	2	3	4
6.	I have a lot in common with people around me.	1	2	3	4
7.	I am no longer close to anyone.	1	2	3	4
8.	My interests and ideas are not shared by those around me.	1	2	3	4
9.	I am an outgoing person.	1	2	3	4
10.	There are people I feel close to.	1	2	3	4
11.	I feel left out.	1	2	3	4
12.	My social relationships are superficial.	1	2	3	4
13.	No one really knows me well.	1	2	3	4
14.	I feel isolated from others.	1	2	3	4
15.	I can find companionship when I want it.	1	2	3	4
16.	There are people who really understand me.	1	2	3	4
17.	I am unhappy being so withdrawn.	1	2	3	4
18.	People are around me but not with me.	1	2	3	4
19.	There are people I can talk to.	1	2	3	4
20.	There are people I can turn to.	1	2	3	4

Appendix 5.

Difficult task (version A) used in Chapter 5 (Study 5).

You have 5 pieces of a picture. Your partner has the 5 remainding pieces necessary to complete the picture. Without showing your partner your pieces or looking at his, you must with the help of your partner put the pieces in the proper order that will complete the picture. Once you have chosen your order write it down on the answer sheet provided. Finally, you and your partner must try to decide what is in the picture.
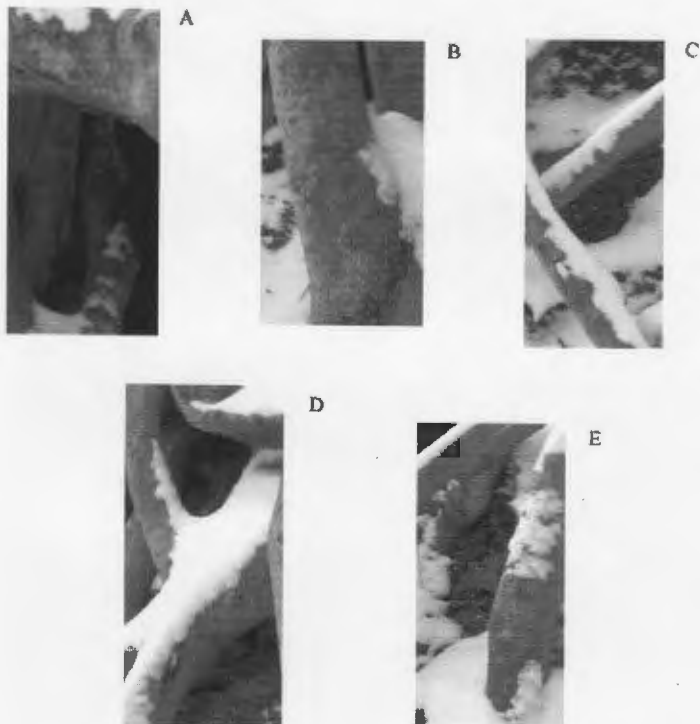
Appendix 6.

Difficult task (version B) used in Chapter 5 (Study 5).

You have 5 pieces of a picture. Your partner has the 5 remainding pieces necessary to complete the picture. Without showing your partner your pieces or looking at his, you must with the help of your partner put the pieces in the proper order that will complete the picture. Once you have chosen your order write it down on the answer sheet provided. Finally, you and your partner must try to decide what is in the picture.
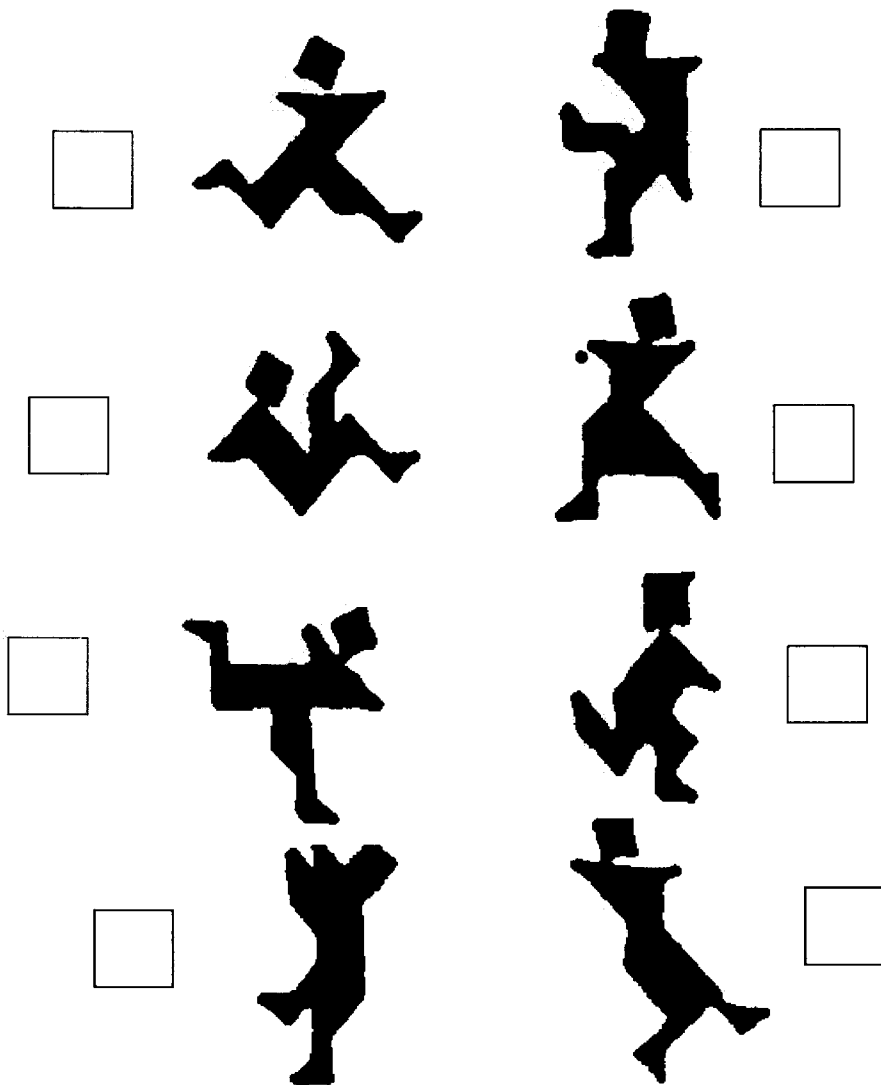
Appendix 7.

Easy task (version A) used in Chapter 5 (Study 5).

You and your partner have both received the same 8 pictures, but in a different order. Your task is to agree upon an order with your partner and number each picture 1 through 8. The picture you number as 1 needs to be exactly the same picture that your partner numbers as 1, and so on for the rest of the pictures. You have 10 minutes to complete this task.

Appendix 8.

Easy task (version B) used in Chapter 5 (Study 5).

You and your partner have both received the same 8 pictures, but in a different order. Your task is to agree upon an order with your partner and number each picture 1 through 8. The picture you number as 1 needs to be exactly the same picture that your partner numbers as 1, and so on for the rest of the pictures. You have 10 minutes to complete this task.