PARTICIPATION IN ONLINE ENVIRONMENTS: ITS RELATIONSHIP TO

ADOLESCENT SELF-CONCEPT

by

DANIELLE M. LAW

B.A. University of Alberta, 2002

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF

THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

in

THE FACULTY OF GRADUATE STUDIES

(Department of Educational and Counselling Psychology, and Special Education;

Human Learning, Development, and Instruction)

We accept this thesis as conforming

To the required standard

THE UNIVERSITY OF BRITISH COLUMBIA

September, 2004

Library Authorization

In presenting this thesis in partial fulfillment of the requirements for an advanced degree at the University of British Columbia, I agree that the Library shall make it freely available for reference and study. I further agree that permission for extensive copying of this thesis for scholarly purposes may be granted by the head of my department or by his or her representatives. It is understood that copying or publication of this thesis for financial gain shall not be allowed without my written permission.

Danielle M. Law	05/10/2004
Name of Author *(please print)*	Date (dd/mm/yyyy)

Title of Thesis: Participation in Online Environments: Its Relationship to Adolescent Self-Concept

Degree: Master of Arts   Year: 2004

Department of   Educational and Counselling Psychology and Special Education

The University of British Columbia
Vancouver, BC   Canada

Abstract

The purpose of this study was to investigate the relationship between online participation and adolescent self-concept. Specifically, this study examined (a) how online participation differed across five online venues (Multi-player Online Role Playing Games, Chatrooms, Instant Messaging, Email, and Newsgroups/Forums), as a function of gender and age, (b) how subjective importance of online venues and the nature of online relationships influenced domain and general self-conceptions, (c) whether online self-conceptions moderate the relationship between domains of self-concept and global self-worth, and (d) whether online self-conceptions mediate the relationship between domain self-conceptions and global self-worth. A total of 363 (184 males, and 179 females) students, whose ages ranged from 11 to 19 years of age, participated in this study. Overall, males used Multi-player Online Role Playing Games, Chatrooms, and Newsgroups/Forums more than females, while females tended to use Email and IM slightly more than males. With regards to Internet participation and self-concept, significant main and interaction effects were found; however, these effects varied according to the online venue, the domain of self-concept, and with whom the adolescents were participating. Additionally, moderation and mediation effects were confirmed for some online venues, thus suggesting that a relationship between online participation and self-concept exists. Several recommendations for future research are discussed.

Table of Contents

Table of Contents (cont'd)

List of Tables

List of Tables (cont'd)

List of Tables (cont'd)

List of Figures

List of Figures (cont'd)

List of Appendices

Acknowledgments

This research has been a tremendous learning experience for me, and could not have been accomplished without the support of my professors, friends, and family. I would like to express my deepest appreciation to my research supervisor, Dr. Jennifer Shapka, for her patience, guidance, and outstanding instruction throughout my research and my time as a graduate student. I am very grateful to Dr. Anita Hubley for her support and valuable expertise, which has contributed significantly to the conceptualization of this study. A big thank you is given to Dr. Laurie Ford for her consistent encouragement and support throughout my graduate career.

I have also been blessed with wonderful friends and family who have seen me through the difficult times. I am indebted to José Domene. This thesis could not have been written without his tremendous assistance and support throughout. I am extremely thankful to Rübab Arim for her source of great motivation and for her help in making this experience enjoyable. Special thanks to Citrus Wong who has shown exceptional patience and understanding as I worked to achieve my goal. I am most thankful to my brother, Jody, and to my parents, Charles and Christine Law, who have greatly shaped my life and to whom I dedicate this work.

Introduction

Computers and the Internet are prevalent around the world. The Internet is a pervasive entity, and has been integrated into the daily lives of millions of people (Bargh, McKenna, & Fitzsimmons, 2002; Gross, Juvonen, & Gable, 2002; Turkle, 1995, Wallace, 1999). With the prevalence of the Internet comes a host of different online venues in which Internet users are becoming increasingly immersed and connected. This intricate network of online media has created virtual environments and subcultures, complete with their own norms, values, and stereotypes (Evans, 2001; Turkle, 1995, Wallace, 1999). Furthermore, like the various environments present in the physical world, a number of online environments exist within the Internet, including Chatrooms, Online Role Playing Games, Email, Personal web pages, Instant Messaging, and Sales and Auctions.

With the emergence of these online media comes a plethora of psychological and social outcomes that have only begun to be examined. Unfortunately, despite the clear importance of assessing the effects of virtual realities on people's lives in the physical world, only a few empirical studies have been conducted, and existing findings are equivocal. The specific topic of the present study is the relationship between online participation and aspects of self-concept. Although the self-concept literature is well-established, very little research has examined the relationship between self-concept and Internet use; therefore, the purpose of this study was to examine the relationship between adolescents' online engagement and their self-concept.

Literature Review

The sections to follow will: a) discuss self-concept and its importance to adolescent development; b) explore five types of online environments and their impact on

adolescent development, c) examine some positive and negative outcomes of online participation, and d) divide online environments into distinct dimensions.

Self-concept and Adolescent Development

Self-concept is of particular importance during adolescence because many simultaneously occurring physical, social, emotional, and other developmental changes occur during this period. That is, individuals undergo puberty and associated physical changes, increase their abstract thinking abilities and other aspects of cognitive development, search for independence and autonomy, and experience an inundation of different social expectations (Brooks-Gunn; 1987, Harter, 1999). With this influx of changes, adolescents are at increased risk for various externalized (e.g., delinquency, substance abuse) or internalized (e.g., depression, feelings of irritation, disruption to sleep) problems (Berryman, Smyth, Taylor, Lamont, & Joiner, 2002).

Self-concept has been linked to many of these problems (Prout & Prout, 1996). For example, lower self-image or self-concept was found to be the best predictor of depression in adolescents (Teri, 1982). Also, adolescent delinquents have been shown to have lower global self-conceptions than their non-delinquent peers (Haddock & Sporakowski, 1982). Additionally, global self-concept has been linked with many issues related to well-being and development, including emotional stability (Brandtstadter & Werner, 1994; Cole, Scott, Martin, Lachlan, & Seroczynski, 2001; Labouvie-Vief, Chiodo, Goguen, & Diehl, 1995), high self-esteem (Campbell, 1990; Kernis, Cornell, Sun, Berry, & Harlow, 1993), positive mental health (Colvin & Block, 1994; Taylor & Brown, 1988, 1994) and identity (Campbell & Assanand, 2000; Turkle, 1995; Wigfield, & Karpathian, 1991).

Despite a wealth of existing empirical research on self-concept and the importance of knowing oneself, no universally accepted definition of the phenomenon exists. One of the most widely accepted models of the self, however, is Harter and Marsh's (Harter, 1999; Marsh, 1986, 1987) hierarchical model. Harter and Marsh independently created hierarchically arranged models for defining the various aspects of the self. Within their hierarchical models of self-concept, an individual's perception of specific behaviors in a particular domain (e.g., good at sports, liked by friends, too tall) forms the base of the model, more general domain perceptions (e.g., physical ability, peer relationships, and appearance) form the upper branches of the model, and an overarching general or global self-concept forms the apex of this hierarchy (Harter, 1999; Marsh, 1990b; Marsh & Hattie, 1996; Marsh & Shavelson, 1985; Wigfield & Karpathian, 1991).

As the branches of the model descend, an individual's self-concept in more specific domains becomes increasingly situation specific and, consequently, less stable. This is particularly true for adolescents. As certain domains become more important to them, these subjectively central domains strongly inform their general self-concept (Harter & Monsour, 1992). In fact, research on adolescent general self-concept has found that the self-structure during this developmental period is disorganized, inconsistent, and often conflicting (Harter, 1999). Moreover, adolescent success in organizing, stabilizing and developing a high or a positive global self-worth influences their overall development. The domains that have been found to have the greatest influence on adolescents' global self-concept are physical appearance and ability, and peer and social relations (Harter, 1990a, 1990b).

Physical Appearance and Physical Ability: During puberty, adolescents are painfully aware of their physical changes and are very sensitive to what others think of them (Harter, 1990c; Lapsley & Rice, 1988; Rosenberg, 1979). Moreover, as noted, the domain of physical self-concept has repeatedly shown to be the primary predictor of self-esteem and of adolescents' general or overall perceptions of their self (e.g., Clifford, 1971; Harter, 1990c, 1993). Specifically, as perceptions of physical appearance and ability increase, so does an adolescent's level of overall self-concept (Adams, 1977; Harter, 1993; Lerner & Karabenick, 1974; Simmons & Rosenberg, 1975). Conversely, adolescents who view themselves negatively in terms of their own physical appearance and abilities also tend to have lower overall self-conceptions (Harter, 1993; Lerner, Orlos, & Knapp, 1976; Ryckman, Robbins, Thornton, & Cantrell, 1982). Previous studies conducted by Marsh (1989) and Harter (1988) have found that males tend to have higher self perceptions of their physical abilities and appearance than do females.

Peer and Social Relations: After physical appearance/ability, social acceptance is consistently found to be the next highest predictor of self-concept in adolescents (Harter, 1990a, 1990b, 1990c; Marsh, 1989). Adolescents are preoccupied with what others think of them (Harter, 1990c; Lapsley & Rice, 1988; Rosenberg, 1979) and, in particular, what their parents, friends, and peers think of them (Berndt, 1999; Birch & Ladd, 1996; Harris, 2000; Vandell, 2000; Wentzel, 2002). Although all kinds of social relationships play important roles in shaping adolescent global self-concept, peers serve a critical function in self-concept development during adolescence (Asher & Rose, 1997; Berndt, 1999; Harris, 2000). According to *group socialization theory*, people who identify with a particular group take on the behaviors and attitudes of that group, with children learning

to behave outside of the home by identifying with a group of others who they perceive to be similar to them (Asher & Rose, 1997; Berndt, 1999; Harris, 2000; Vandell, 2000). With regards to the self-conceptions adolescents have of their own peer and social relationships, Lavoritano and Segal (1992) found that girls scored higher than boys in the Close Friendship domain, but sex differences on the Social Acceptance subscale were not significant.

Additionally, close friendships are critical for the social-emotional adjustment of individuals, especially during adolescence. Previous research has demonstrated that adolescents who experience positive relationships with friends and feel accepted by their peer group generally function better socially, emotionally and academically. In contrast, adolescents who are rejected from or neglected by their peer groups, or who do not have positive relationships with friends, are at increased risk of loneliness, depression and aggression (Asher & Rose; Berndt, 1999; Birch & Ladd, 1996).

In summary, it has been well established that physical appearance and ability, as well as peer environments and cultural contexts, influence the development of self-concept in adolescents. However, a question that remains is how these factors affect development in domain and global self-conceptions when adolescents are immersed in an increasingly technologically advanced world. This question is particularly salient because physical appearance and social relations are two domains of self-concept that are highly susceptible to being affected by online involvement. Specifically, online venues easily permit individuals to portray themselves as having different physical abilities and appearances because there is usually no visual contact between people on the Internet. Many online venues are also designed specifically to facilitate social interactions and the

development of relationships (e.g., chatrooms). Even those venues that are not designed for social interaction per se are often frequented by individuals who share a common interest (e.g., online gaming, Newsgroups). The main purpose of this study is to empirically determine how involvement in online venues and online participation is related to adolescent self-concept in certain domains, and whether online involvement has a direct or indirect influence on global self-worth.

Online Environments

In this technologically progressive world, various emergent technologies, such as electronic mail (Email), online games, chatrooms, and WebPages, have opened the doors of communication, entertainment, and knowledge to adolescents worldwide. Many Canadian adolescents have an Email account, use Instant Messaging, participate in chatrooms, and play online games (Environics Group, 2001). These online venues may contain overlapping norms and regulations that are characteristic of the larger Internet environment; however, each medium is also fundamentally different in the way it functions and in the way individuals use it (Environics Group, 2001; Turkle, 1995; Wallace, 1999). The four environments most widely used by adolescents – multi-player online role playing games, chatrooms, Instant Messaging, and Email – were the focus of this study. However, a fifth online medium, namely Newsgroups/Forums, was also examined. Although Newsgroups/Forums were not found to be among the primary venues in which adolescents are immersed (Environics Group, 2001), it was included to determine how a less interactive environment is related to adolescent self-concept. What follows is a fuller description of these five venues.

Multi-player online role-playing games: Multi-player online role playing games (MORPGs) require participants to login anonymously and to create a role-playing character that may or may not be equivalent to the self they portray in their physical, or "real", world. Turkle's (1995) and Wallace's (1999) description of an online gaming genre, the text based, multi-user dungeon (MUD) provides a general idea of some of the role playing game environments that continue to exist today. MUDs allow users to engage in real-time role-playing adventures in which they create and equip a character and use this character to explore the gaming environment and accomplish goals, while simultaneously interacting with the characters of other logged-on users. Players must select the physical attributes, abilities and powers, and personality styles of their characters. Often, these characteristics are not a reflection of their own attributes in their physical, offline world. For example, depending on the specific gaming environment, a shy, physically small 13 year old boy could either don the persona of a swashbuckling spaceship pilot who specializes in smuggling, or choose to be a beautiful Elvin sorceress with the power to cast devastating spells on "her" enemies. While text-based MUD environments were predominant as recently as seven years ago (Turkle, 1995), they are rapidly being replaced by graphically-based environments, in which users maneuver a physical character around interactive environments that are displayed in high-resolution graphics with sound (Incan Monkey God Studios, 2002), such as Everquest, Star Wars Online, and the SIMs.

Anonymous Chatrooms: This type of online venue allows individuals to login and chat with others who can be identified only by nickname. This environment differs from MORPGs, in which users interact with others in order to accomplish other game-related

goals. Instead, the social space of online Chatrooms is used primarily for interacting and chatting with others in real-time on a wide variety of topics including: politics, gardening, religion, music, sex, and television shows (Turkle, 1995). Chatrooms are not perceived as games but rather venues in which one can communicate with others online, with users "talking" back and forth by typing messages to each other.

Instant Messenger: Instant Messenger (IM) allows individuals to communicate to an identifiable other (e.g., friend, co-worker, family member) via text messaging windows. This textual avenue for communication allows users to see which friends are online and, due to its dyadic, private, and real-time nature, is comparable to talking on the phone or meeting with someone face to face (Gross, et al., 2002). Recent research conducted by the Pew Internet and American Life Project (2001) has indicated that IMing has become a primary mode of communication for middle and upper class adolescents. While IM use has not replaced traditional after-school activities for adolescents (i.e., clubs, sports, or meeting face to face with friends), this mode of communication has provided adolescents another avenue to communicate and create closer relationships with their friends (Gross, Juvonen, & Gable, 2002).

Email: Email communication has become a popular form of communication around the world (Holliday, 1999; Russell & Cohen, 1997, Warschauer, 1996). Email differs from regular mail in a number of significant ways. In comparison to postal letters, transmission is far more rapid, costs are more likely to be fixed, and the format is more conducive to shorter, more frequent communications. As with regular mail, communication over Email can be casual, formal, or intimate, depending on the relationship between the two corresponding individuals. Also, Email does not occur in

real-time (i.e., the person to whom the message is being sent does not have to be online at that time). Research on Email use suggests that those who interact across cultures via Email become more aware of other cultures and their language (Cohen & Miyake, 1986), and students who Email internationally tend to be more open to sharing information (Ma, 1993). Furthermore, Barker and Kemp (1990) found that students interacted and exchanged essays and other written work for commentary and criticism by their peers more frequently over Email.

Newsgroups and Forums: These venues allow subscribers to read the thoughts and ideas of others, without any direct interaction with other Newsgroup subscribers. Subscribers can choose to post and respond to the submissions (referred to as posters) or participate only by reading the posts of others (referred to as lurkers). Newsgroups and Forums do not occur in real-time, in that individuals can log on at any time to see what submissions have been added to the ongoing Forum. Little research has been conducted regarding the effects of Newsgroup usage on self-concept, although McKenna and Bargh (1998) have found a link between identity and participation. The status of a subscriber (lurker vs. poster) significantly affects his or her acceptance of self and his or her socialization with others (i.e., posters placed more import on group identity, were more affected by others' opinions, and had higher self-acceptance). Additionally, it is possible that, at least for people who are posters, Newsgroups function in a similar manner as subculture-specific print media (e.g., skateboarding magazines), or to a bulletin board or editorial page for posting ideas and messages, but their interactive nature (i.e., users have the ability to post their opinions and receive feedback) may lead Newsgroups to have

different influences on the development of self-concept than magazines and books which are targeted to a specific topic.

Anonymity and Synchronicity of Online Environments

A multitude of different online environments exist; however, this study focused on the five described above. Specifically, this study sought to identify the aspects of these five virtual avenues that are most related to self-concept. As such, self-concept was examined in terms of two characteristics that cut across the five environments: 1) Anonymity of the environments, and 2) Synchronicity of the environments.

For the purposes of this study, *non-anonymous environments* were defined as online venues where participants are likely to interact with people who they also know in the offline world. Two such mediums included Email and IM; these environments were more likely to be used by individuals who also knew each other offline and used online communication to supplement their offline relationship (it is recognized that it is possible for people to only know each other through Email or IM and not in person, but this is not usually the case) (Environics Group, 2001). In contrast, *anonymous environments* referred to online arenas where individuals interacted primarily with people they did not know offline. The three types of anonymous environments examined in this study were MORPGs, chatrooms, and Newsgroups/Forums. Again, although it is possible for individuals to engage in these online venues with people they also know offline, previous research has shown that the majority of individuals who participate in these environments only know each other online (Environics Group, 2001).

For Synchronicity, *asynchronous* environments referred to venues where the medium of communication did not require participants to be online at the same time to

interact with each other. Email and Newsgroups are examples of virtual avenues that fit into an asynchronous online environment, with the former being analogous to sending postal letters and the latter being analogous to using a community bulletin board or editorial for posting ideas and messages. *Synchronous* environments, on the other hand, are avenues where participants must interact with each other in real-time, and is comparable to talking on the phone or meeting face-to-face. Examples of this form of online communication include role playing games, Instant Messenger, and chatrooms.

Online Dimensions

One of the primary focuses of this study was to examine what personal dimensions of the environment most influences adolescent self-concept. Two dimensions of online participation were examined: 1) the importance adolescents place on the online environment (Online Importance), and 2) whether their online interactions are socially oriented or not (Social).

Previous research has found that the greater importance or meaning an individual places on a certain activity or issue, the more influential that activity or issue is for his or her self-concept (Harter, 1990a); as such, it was hypothesized that adolescent self-concept would vary according to how important that venue was to them. Social Dimensions of an online avenue, on the other hand, refers to the nature of the relationship individuals who participated in these online mediums had with each other. For this study, participants who frequented a virtual avenue with the primary purpose of carrying out the goals for which the medium was created (e.g., to discuss plants, express an opinion on an issue, or destroy as many mutant zombies as possible) was defined as participating in this environment to complete a certain task. For example, an individual who frequented a

chatroom dedicated to discussing movies and discusses issues relevant to movies was said to visit this chatroom for a task related purpose. Similarly, individuals who engaged in MORPGs in order to win the game would was said to frequent this gaming environment for task purposes. Alternatively, individuals who engaged in a virtual arena to facilitate friendships or more personal bonds with other participants were said to frequent these environments with a social purpose in mind. For example, individuals who visited a Chatroom devoted to discussing cars, but who had developed more personal relationships with other participants in this chatroom, and now participated in the chatroom to socialize on a more personal level, were said to engage in this venue primarily on a social dimension. Similarly, individuals who formed close friendships within an MORPG gaming environment and spent their online time devoted to discussing personal issues with these friends, rather than to accomplishing the goals of the game were thought of as using the gaming environment for social purposes. Given that peers and friendships play a critical role in the developing adolescent, it was hypothesized that the nature of the relationship (whether social or not) participants had with those with whom they interacted would determine how influential that online environment would be for that individual's self-concept.

Online Self-Concept

To understand how online environments might influence the relationship between domains of self-concept and overall general self-worth, this study explored whether online self perceptions acted as a mediating and/or moderating link between domain specific self-concept and global self-worth. Since individuals have the potential to change their physical appearances and abilities online, and are given the opportunity to

build close friendships and feel accepted by others (two predictors of global self worth), it is likely that these self perceptions might differ from their offline perceptions and differentially influence their overall self worth. For example, if an adolescent plays a particular MORPG and lives through a character that possesses physical characteristics she wishes she possessed offline (i.e., a beautiful Elvin princess with long blond hair and the physical ability to gracefully slay zombies), the perception she has of her online character, or self, will likely differ from her offline self-perception of physical ability and appearance. Similarly, previous research has found that some online environments are conducive for the development of close friendships and feelings of acceptance (Gross, Juvonen, & Gable, 2002). These online close friendships and feelings of acceptance might be different from one's self-perceptions of close friendships and social acceptance offline.

Because physical appearance and physical ability have been found to be strongest predictor of global self-concept, it can be inferred that the extent to which an individual is satisfied with her online physical appearance and ability might act as a moderator and/or a mediator of her offline self-perceptions of physical appearance and ability and, as a result, her global self worth. Similarly, it is possible that an individual's online relationships may moderate and/or mediate the relationship between his offline social and friendship self-conceptions and his overall self-concept, because social relationship and close friendship self-conceptions are also consistent predictors of self worth. For example, if an individual has low self-perceptions of his close friendships offline, but feels socially accepted and has close friendships online, the possibility that his online close friendships acts as a mediator, by suppressing the debilitating relationship between

offline self concept of close friendships and general self worth, exists. Alternatively, it is possible that the interaction between an individual's high offline self-perceptions of physical ability and high online self-perceptions in this domain work together to synergistically increase overall general self-concept.

Online Participation and Self-Concept in Adolescents

This study addressed how participation in the five online environments described above was related to self-concept in adolescents. Because adolescence is a transitional period during which individuals are in the process of redefining their sense of self, the potential influence of these online mediums on development is profound. Although no study has specifically examined the relationship between online engagement and adolescent self-concept, a body of research concerning the beneficial and detrimental influences of online participation on general human development has begun to emerge.

Beneficial Influences: Previous studies have shown that anonymous, synchronous online environments, such as MORPGs and Chatrooms, provide individuals with the opportunity to communicate with others, experience different perspectives, and experiment with alternative selves (Turkle, 1995). The implications of this finding for self-concept development in adolescents are critical. For example, Turkle (1995) explains how these anonymous online venues assist individuals in opening their minds to different perspectives as they experiment with different roles. This has implications for the development of empathy and an understanding of the motives behind certain actions. Rosenberg (1986) explained that, "It is through role-taking and social interaction that the individual discovers an inner psychological world, conceptualizes the self in terms of interpersonal relationships, rests conclusions about the self on logical and evidential

foundations, and anchors knowledge about the self within the self" (page 119). These unknown online environments also give adolescents a private venue for role playing and redefining their self-concept. By interacting with others online, and experimenting with different perspectives and roles, online venues provide adolescents with the opportunity to experience and understand things from different points of view, thus aiding them in developing empathy, which is a critical ingredient for social, emotional, and academic development (Cohen, 2001; Harter, 1999; Schonert-Reichl & Hymel, 1996). Turkle (1995) also describes how interacting in these online avenues reveal aspects of individuals they may not have previously realized they possessed. Additionally, some online participants have reported feeling more confident in their abilities, and applied this newfound confidence in their "real" physical world.

Additionally, these anonymous online environments give adolescents a private venue for role playing and developing the various domains of their self-concept. Bargh et al. (2002) describe how the anonymity of this online community "enables one to express oneself and behave in ways not available in one's usual social sphere, both because one is free of the expectations and constraints placed on us by those who know us, and because of the costs and risks of social sanctions" (page 35). Because these online communities allow individuals to explore their alternative selves in a secure environment, the only accountability they experience for the online self they choose to be occurs within this online environment, rather than in the external world (Bargh, et al., 2002; Turkle, 1995). The non-visual interface of virtually all current Internet mediums permits users to present themselves as having different physical characteristics than they do offline, which may have several vital implications for adolescent self-concept.

Because the combined self perceptions of one's physical appearance and physical ability are the strongest predictor of self-concept (Clifford, 1971; Harter, 1990c, 1993), it becomes important to determine whether online presentations of physical appearance and physical abilities influence real world domain specific self-perceptions and, consequently, their overall sense of self-worth.

In addition to giving individuals an avenue for exploring their alternative-selves, participation in online avenues also allows for the fostering of relationships and friendships with others. Research suggests that, when individuals feel connected with school-based peers, they use the Internet to explore more opportunities for social interaction (Gross, et. al., 2002). Furthermore, Dietz-Uhler and Bishor-Clark (2001) have found that face-to-face classroom discussions that were preceded by computer communication are perceived as more enjoyable than face-to-face discussions alone. Additionally, Bargh et al, (2002) found that, compared to face-to-face interactions, individuals are better able to present their true or inner selves, have these selves accepted by others, and build intimate and close relationships with the individuals they relate to in an online setting.

Adolescence is a period during which individuals long for communion and relationship, and tend to form their self-concepts in terms of their relationships with others (Harter, 1999; Rosenberg, 1986). Consequently, friendships high in stability and in the disclosure of intimate thoughts and feelings can heighten adolescents' feelings of self worth; thus, leading to the demonstration of more positive social behaviors and an increased sense of self (Berndt, 1999). Given this, engagement in public forms of online avenues could play a positive role in self-concept development. Of great import are the

findings that Internet relationships can be as durable as face-to-face friendships, and that most individuals who formed these relationships/friendships were individuals who tended to be socially anxious or lonely, but felt accepted and liked in online communities (McKenna et al, 2002). It appears as if friendships maintained through *non-anonymous* online environments (Email or IM) have an equivalent function as face-to-face friendships, in terms of the self-concept development process. Because peers and social acceptance are second only to physical appearance and ability as the best predictors of general self-concept, it is likely that adolescents who feel accepted online will have higher general self-conceptions (Harter, 1990c; Harter et al., 1991). This possibility, however, requires empirical verification.

Detrimental Influences: Researchers have also found that, as Internet use increases, so does its potential to negatively impact the psychological well being of the participant (e.g., depression, loneliness, feelings of helplessness, anxiety and/or guilt) (Morahan-Martin & Schumacher, 1997, as cited in Wang, 2001). Furthermore, there may be negative consequences of experimenting with these alternative selves online and then returning to the "real" physical world. Online gaming, in particular, has the potential to blur "the boundary between self and game, self and role, self and simulation" (Turkle, 1995, p. 192). The potential consequences of this blurring of boundaries on adolescent self-concept remain unexamined. If adolescents are using MORPGs or Chatrooms as an avenue to escape from the real world (Turkle, 1995), there may be negative implications for their ability to cope with the problems of the physical world. Although further research on the impact of this "online escapism" is required, it is possible that this blurring of offline reality and online life could contribute to adolescents developing

unrealistic self-appraisals (i.e., they come to believe that they actually have the abilities and characteristics of their game character). Alternatively, it may lead to a retreat into an online life accompanied by a disengagement from activities in the physical world (Turkle, 1995; Wallace, 1999).

In addition to the issues surrounding blurring of online and offline realities, concern has been shown in the area of Internet addiction, or Pathological Internet Use (PIU) (Chou & Hsiao, 1999; Davis, 2001; Morahan-Martin & Schumacher, 2000). PIU is defined as those individuals who are dependent on a specific function of the Internet. While Internet technology can increase the severity of some traditional addictions (e.g., gambling), the principal issue in the present context is a dependency on online social interaction opportunities, such as Chatrooms and MORPGs.

Additionally, because previous literature also indicates that adolescents tend to compartmentalize their alternative selves and have difficulty combining and integrating them across social contexts (Case, 1985; Fischer, 1980; Higgins, 1991 in Harter, 1999), a question arises as to how these adolescents combine and integrate not only their selves in general, but their online selves with their offline selves. Closely related to this is the question of how different domains of self-concept might be integrated with or influenced by online engagement and, subsequently, how this impacts adolescents' feelings of general self-worth.

Summary

As Internet communities become increasingly pervasive, the potential impact of these environments on adolescent self-concept is profound. These online avenues not only give adolescents a relatively safe place to explore alternative selves as they develop

their self-concept, but also provides them with an outlet for experimentation, an opportunity to build long lasting and valuable friendships, and the opportunity to adopt different perspectives – all of which will have been shown to positively influence the development of adolescents' sense of self. Unfortunately, adolescents may also become lost in these online worlds and retreat from physical reality, with their self-concept development being negatively influenced as they become more susceptible to PIU, depression, and loneliness (Chou et.al., 1999; Davis, 2001; Morahan-Martin, et.al., 2000 Turkle, 1995; Wang, 2001).

Adolescents undergo a plethora of physical, cognitive, social, and emotional changes as they struggle through puberty; changes in social expectations, and changes in how they see themselves. It appears as if involvement with online mediums has the potential to both help and hinder with this stage of development. The degree to which these helpful and detrimental effects are related to the domains of self-concept and to their global self-worth were explored in this study.

Purpose of this Study

Although previous studies have examined self-concept and how it develops for adolescents, as well as how online environments are related to different aspects of the development of self, no existing research has specifically explored the relationship between online socialization and adolescent self-concept. This was the purpose of this study. Specifically, this study examined how participation in online environments was related to adolescents' domain specific self-concepts and global self-worth, as well as whether aspects of online socializing mediated and/or moderated the relationship between

the different domains of self-concept and overall self worth. Five specific questions were addressed in this study, as described below:

Question one. How does online participation differ for each of the online environments, as a function of age and gender? In terms of the online venues, it was expected that, in keeping with previous research, boys would be more likely to play MORPGs (Environics Group, 2001; Subrahmanyam, Greenfield, Kraut & Gross, 2001). In terms of chatrooms, IM, and Email, however, it was predicted that participation in these mediums would be equivalent across genders. There is insufficient prior evidence to allow for directional hypotheses of gender differences in the Newsgroup/Forums venue, but the possibility that such differences exist is not to be discounted. In terms of age, engagement in all the environments was expected to increase with age (Environics Group, 2001).

Question two. The second research question examined whether and how, online engagement differed in terms of the Anonymity and Synchronicity of the online venues. Doing so provides a mechanism for determining whether it is the type of online venue (i.e., anonymous, synchronous), rather than the specific environment itself, that is the critical component in accounting for developmental and gendered Internet use patterns.

Question three. The next research question explored the influence of *who* the participants in this study were actually interacting with online (whether they knew them offline or only knew them online) on domain specific and global self-concepts. In addition, this question was aimed at understanding how the dimensions of online mediums (i.e., the subjective importance of each venue; the nature of the online relationship) influenced domain specific self-conceptions and global self worth, as a

function of age and gender. Because adolescence is a time when individuals long for close friendships and acceptance by others, it was anticipated that participants who use the Internet for social reasons and place a high importance on that usage (perhaps associated with greater feelings of acceptance if they have made many online close friendships) would have higher social, peer, and global self-concepts. Alternatively, if an individual frequents an online avenue for other reasons (e.g., to play a game) and identifies less with that venue, his/her social and peer self-conceptions and global self-worth would be minimally related to his/her online participation.

This question also explored the interaction of who participants were interacting with (Known vs. Unknown) and the dimensions (importance they placed on the venue and whether they used the venue for social or other purposes), and how this influenced domain and global self-concept. It will be interesting to see whether adolescents who communicate with people they do not know, and place high importance on this communication, have lower or higher general self-concepts.

Question four: Another important issue this study examined is whether online self-concept moderates the relationship between the domains of self-concept and global self-worth. Previous studies on the Moderation Model (Baron & Kenny, 1986; Holmbeck, 1997) have explained that a moderator variable falls between the causal pathway of two variables (an independent and a dependent variable, respectively); that is, if an independent variable has a direct influence on the dependent variable, the interaction between the moderating variable and the independent variable will work together in influencing the dependent variable. Two moderational hypotheses have been derived, one for each of the self-concept domains: In terms of physical appearance/ability, it was

expected that the extent to which an individual is satisfied with his online ability/appearance will interact with his offline perceptions in this domain in influencing global self-worth. For example, if an individual has low self-perceptions of his physical appearance offline and low online self-perceptions in this domain, it is predicted that the interaction between these two variables will further decrease his global self-concept. With respect to social and peer relationships, it was predicted that if an individual has high offline self-conceptions in this domain and high online self-conceptions in this domain, the marriage of these two variables will be associated with an even higher global self-concept.

Question five. The final research question that was addressed is whether online self-conceptions mediated the relationship between offline self-conceptions and global self worth. Baron and Kenny (1986) and Holmbeck (1997) clarify a mediating relationship as a relationship where a mediating variable (online self-concept) suppresses the effects of the independent variable (offline self-concept), thus changing the influence the independent variable has on the dependent variable. Two mediational hypotheses were derived in accordance to the self-concept domains examined in this study (physical appearance/ability, and social/peer relationships). If an adolescent is not satisfied with her offline appearance/ability, but finds satisfaction with the physical appearance/ability she creates in a virtual environment, it is expected that the high sense of virtual appearance and ability will suppress the debilitating effects of her offline appearance/ability on her overall self-worth. Similar patterns were expected in the domain of social and peer relationships; that is, it was predicted that the extent to which individuals feel accepted online, and the extent to which they have close online

friendships, would mediate the relationship between his or her offline peer and social relationships and his/her global self-worth. For example, if an individual has lower offline self-perceptions of her peer relations (and consequently has lower global self-concept) but has high online self-perceptions of her peer relations, then her online self-perceptions will mediate the relationship between offline self-perceptions and global self-concept; thus increasing her global self-concept.

Methodology

Participants

Participants for this study included 369 students from three middle and two high schools in the lower mainland of British Columbia. Students in grades 6 through 12 were recruited to ensure the sample included individuals at all stages of adolescence. All participants were between the ages of 11 and 19 at the time of data collection, and the gender split was 184 males, 179 females.

Procedures

This study involved two phases. The first phase involved designing appropriate measures and pilot testing to assess the adequacy of those measures. Because this is the first study of its kind, it was necessary to develop a questionnaire to assess the characteristics and dimensions of online participation. Questions were developed from existing theory and collaboratively constructed by a team of researchers with expertise in measurement, test construction, quantitative and qualitative methods, child and adolescent development, and technology/Internet use. Regular research meetings were scheduled to discuss and refine the questions before the questionnaire was administered to five students (in grades 6 – 9) to assess their clarity. The students reported that they

understood all the questions, and made only minor suggestions for changes, so no piloting of the measure with older students was deemed necessary. Changes were made to the initial questionnaire on the basis of the feedback from the pilot participants.

Questionnaires were group-administered to middle and upper middle class students from the lower mainland of British Columbia during class hours, after a brief introduction and explanation of the purpose of the study. To ensure that students clearly understood the items, research assistants were available to individually address any confusion that arose. Most students were able to complete the questionnaire in 30 – 45 minutes.

The survey was divided into seven sections: Demographic information, MORPGs, Chatrooms, IM, Email, Newsgroup/Forums, and Marsh's Self Description Questionnaire II. All participants were asked to complete the demographic information and Marsh's self-concept scale. Participants were not asked to complete the sections regarding the online environment(s) which they did not frequent. A copy of the questionnaire can be found in Appendix A, and parent/student information forms can be found in Appendix B.

Measures

Demographic Information: Demographic information regarding age, gender, grade, and native language were collected (see Appendix A, questions 1, 2, 3, and 6), in multiple choice formats, to gain a better understanding of the type of students answering the questionnaire. Both age and gender were used as independent variables and as control variables, depending on the research question. The age of participants were categorized according to their stage of adolescence (early, middle, or late). Early adolescence included those who were between the ages of 12 and 13, middle adolescence

encompassed those between the ages of 14 and 16, and late adolescence consisted of participants between the ages of 17 and 19.

Primary language spoken at home was also included as a control variable to account for cultural diversity in highly verbal venues (such as IM and Email). Note that it was not included in Chatrooms due to the low n for this venue. Dummy variables were used in the creation of this variable. Participants who indicated they primarily spoke English at home were assigned a 1, while those who indicated as primarily speaking a language other than English at home were labeled as 0.

Time Spent in online venue: This variable acted as a dependent variable and was used to identify gender and age differences in the amount of time participants spent in each online venue. For each online medium examined in this study, participants were asked to choose, from a set of between two and four multiple choice responses (depending on the subscale), how much time they spent in a specific online environment per week, per day and in one sitting (refer to Appendix A, questions 9 to 11 for an example). To create a total score for time spent in each venue, the mean scores for each of the time spent variables, for each online medium were calculated. The mean and standard deviations are: $M = 1.82$, $SD = 2.70$ for MORPGs; $M = .83$, $SD = 1.81$ for Chatrooms; $M = 4.36$, $SD = 3.26$ for IM; $M = 2.54$, $SD = 1.59$ for Email; $M = 1.68$, $SD = 2.84$ for Newsgroups/Forums.

Anonymity vs. Synchronicity. These variables (anonymous and non-anonymous; synchronous and asynchronous) were created to assess whether examining online participation according to anonymity or synchronicity, rather than by specific online medium, would be a better way of examining gendered and developmental Internet use

patterns. The Anonymity variables were created by calculating the mean time spent in anonymous venues (determined by previous research to be MORPGs, Chatrooms, and Newsgroups) and the mean time spent in non-anonymous venues (IM and Email). Similarly, the Synchronicity variable was created by calculating the mean time spent in synchronous environments (MORPGs, Chatrooms, and IM) and for asynchronous environments (Email and Newsgroups/Forums).

Known vs Unknown Communication: To determine whether adolescents in this study were participating with people they knew offline or did not know offline, a Known vs. Unknown variable was created for each online venue. Participants were asked to record, on two 5-point Likert scales (*1 = Disagree* and *5 = Agree*) for each online environment, the extent to which they participated in a certain online avenue with people they know offline, and the extent to which they participated with people they do not know offline (see Appendix A, questions 72 and 73 for an example). To obtain a total score for whether they were participating with people they know offline or do not know offline, scales were reverse coded where necessary and the mean scores for each question in the scale, for each participant, was calculated. Higher mean scores indicated greater participation with people they know offline. This variable was used as an independent variable for assessing whether participation with people who are known offline or unknown offline had any influence on self-concept.

Dimensions of Online Participation: Dimension variables acted as independent variables for assessing whether the nature of online participation (for social or other reasons) and/or the importance individuals place on a particular venue influences his or her self-concept. No measure for the dimensions of online participation exists, as such,

two 5-point Likert scales (1=Not at all important and 5=Very important), for each online environment, were asked in order to assess the *Importance* adolescents placed on the online environment (refer to Appendix A, question 87 and 89 for an example). Mean scores for importance placed on an online venue were calculated to obtain a total importance score. A lower mean score indicated that lower importance was placed on that online environment.

Additionally, between four and five (depending on the online environment) questions were asked, for each of the online mediums included in this study, to examine the *Social* nature of online participation. The number of questions varied slightly for the online environments. Variations were based on the manner in which the online medium functioned. For example, a question similar to one included in the MORPGs sub-scale, *"I switch from one MORPGs to another depending on which one my friends are playing"*, would not make sense for the Email environment since individuals can not switch from one Email to another Email depending on their friends. Students were asked to respond using a 5-point Likert scale, ranging from 1 (Disagree) to 5 (Agree) (See Appendix A, questions, questions 74 and 86 for examples). To obtain a score for this measure, mean scores were calculated. Higher scores were indicative of greater online environment use for social purposes. Given that these scales consisted of at most 5 items, and Cronbach alpha values are sensitive to the number of items in a scale, inter-item correlations were performed. Inter-item correlations for this study were within the optimal range, as recommended by Briggs and Cheek (1986).

Online Engagement and Self-Concept: To examine the relationship between online participation and online self-conceptions of physical abilities/appearance, as well

as the mediating and moderating factors between physical appearance and ability on global self worth, three questionnaire items were developed, per venue, to assess online physical appearance/ability. Participants responded using a 5-point Likert scale (refer to Appendix A, question 20, 26, 51 and 55 for a few examples of specific questionnaire items). Scores for each of the online self-conception domains were calculated by taking the mean of the items for each domain. Higher scores indicated higher self-conceptions for each of these domains. Inter-item correlations for online physical appearance/ability were within the optimal range for all venues except for MORPGs. For this venue, mean scores for physical appearance/ability were calculated with the uncorrelated item removed.

The relationship between online participation and self-conceptions of close friendships, in addition to the mediating and moderating factors of close friendships, on global self-concept, were examined using three 5-point Likert scales (e.g., How much as using IM strengthened your friendships with people you only know online?; 1 = Not at all and 5 = A lot), for each online medium. Total online close friendship scores were attained by calculating the mean of the item scores. High scores demonstrated high self-conceptions of close friendships. Similarly, overall online self-concept was measured using 5 point Likert scales for each online venue (3 items, e.g., Do you prefer the person you are over Email better than the person you are in real life?; 1 = Prefer offline self and 5 = Prefer online self). Mean scores for each item score was taken to obtain a total mean score for online general self-concept. Inter-item correlations were in the optimal range for all the online environments, with the exception of MORPGs. In this case, the score

for online general self-concept was measured using the scores from the one item that was correlated with Marsh's self-conceptual domains.

Offline Self-Concept Scale: To measure self-concept, subscales from Marsh's (1990) Self Description Questionnaire II were used to assess adolescent self-concept in five nonacademic domains: physical ability, physical appearance, peer relations, social relations (with the same and the opposite sex), and global self-concept. These measures target adolescents between the ages of 12 and 18 years, and the items are structured on a 6-point Likert scale format with approximately 10 questions per subscale. Respondents are asked to rate whether the statement is *False, Mostly false, More False than True, More True than False, Mostly True,* or *True,* and half the items in each subscale are negatively worded to serve as a response check. In terms of reliability, high internal consistency scores for the Total Self-Concept score were found to be 0.94. Additionally, high internal consistency for the four domains of self-concept examined in this study were also found (Physical Abilities (α = 0.85), Physical Appearance (α = 0.91), Opposite Sex Relations (α = 0.90), Same-Sex Relations (α = 0.86), and General Self (α = 0.88). It should be noted that, while similar, Marsh's model of self-concept was chosen over Harter's scale because his measure is suitable for the entire age-range included in this study; whereas Harter requires separate scales for middle and high school students, thus increasing the sources of potential error in the analysis process, and increasing the complexity of the interpretation process.

Missing values: For each online venue, cases with 80% or more missing responses, for any given sub-scale, were considered as not participating in that online environment, because participants were instructed to omit the sections pertaining to any

medium that they did not use Further reassurance that missing values for a sub-scale were attributable to non-participation in an online medium was obtained by comparing the number of cases who completed the sub-scale with the number of individuals who responded "yes" to the general question "Do you use <insert online venue>?", and receiving consensus between the comparisons. Six cases were completely removed from the analyses because these cases only partially or sporadically completed the questionnaire. Little discrepancy was found between the two methods of categorizing non-participants.

Results

The results are presented in six sections: Preliminary analyses are described first. The next two sections examine how online participation differs for each online environment, and how online engagement differs according to the Anonymity and the Synchronicity of online medium, as a function of gender and age. The next section explores how the dimensions of online media (i.e., the importance of each medium to the participant; the nature of the online relationship) influence domain specific self-conceptions and global self worth, as a function of age and gender. Next, interaction effects between Known vs. Unknown and Dimensions, on general self-concept, are examined. The next section investigates whether online domain self-concept acts as a moderator between offline domain specific self-concept and general self-concept. Finally, mediation effects of online domain specific self-conceptions on offline domain specific self-conceptions and general self-concept are examined.

Preliminary Analyses

Initially, the data set was screened for violations of assumptions, using the procedures suggested by Tabachnick and Fidell (2001). P-P plots were used to inspect the shape of the distribution for each continuous variable. The plots yielded relatively straight lines for each variable, suggesting normal distributions. Potential univariate outliers were identified by examining box and whisker plots and scrutinizing for the possibility of error during data entry. A minimal number of outliers were found and, for the sake of maintaining power, values for the few existing outliers were transformed to fit within the normal range.

Research Question 1: Gender and Age Differences in Online Venue Participation

In order to assess gender and age differences in online participation across venues, and to verify the findings of previous research, Multivariate Analysis of Variance (MANOVA) was utilized, with the mean scores of time spent in each online venue as the dependent variables, and gender and stage of adolescence as fixed factors. Statistically significant differences between males and females on the combined dependent variables were found: $F(5,352) = 15.64, p < .001$. When the results for the dependent variables were considered separately, males spent more time participating in MORPGs, Chatrooms, and Newsgroups while females used IM and Email only slightly more than boys; however, only the time spent using Email was found to be significantly higher. A breakdown of the percent of online venue use, by gender, is presented in Table 1 and the estimated marginal means for these data are presented in Table 2.

Statistically significant differences between early, middle and late adolescents were also found: $F(10, 704) = 4.8, p < .001$. The dependent variables were then

examined separately using Dunnett's t-test and statistically significant age differences were found for time spent in MORPGs, IM, and Email (Dunnett's t-test was chosen because the assumptions for this post-hoc test do not assume equal variances). Specifically, differences were found between Early and Late adolescence in time spent participating in MORPGs, with younger participants spending more time than their older counterparts in this venue. Statistically significant differences were found between Middle and Late Adolescence for time spent in using Email, with middle adolescents using Email more than later adolescents (Please refer to Table 2).

Research Question 2: Anonymity and Synchronicity

With the knowledge that age and gender differences exist in time spent participating online, the next analyses were aimed at understanding whether it is the venue itself that accounts for this difference, or whether it is the *kind* of online venue that is important. Recall that online venues have been labeled according to Anonymity – whether participating in the venue is generally anonymous (MORPGs, Chatrooms, and Newsgroups/Forums) or not (IM and Email) and according to Synchronicity – whether interaction in the venue is synchronous (MORPGs, Chatrooms, IM) or asynchronous (Email and Newsgroups/Forums).

MANOVA analyses were performed to determine whether time spent participating online differed according to the Anonymity and/or Synchronicity of the online venue, as a function of age and gender. The mean time spent in Anonymous (MORPGs, Chatrooms, and Newsgroups/Forums) and Non-anonymous (IM and Email) venues were the dependent variables in examining Anonymity, while mean time spent in synchronous (MORPGs, Chatrooms, and IM) and asynchronous (Email and

Newsgroups/Forums) were the dependent variables in assessing Synchronicity. Again, preliminary assumption testing was conducted and no serious violations were noted. Statistically significant differences between males and females for Anonymity was found, $F(2,355) = 28.31$, $p < .001$, with males using anonymous venues (such as MORPGs, Chatrooms, and Newsgroups/Forums) more than females did (*Mean difference* = 4.1, $p <$ .001). Although females used non-anonymous media (such as IM and Email) more than males, the difference was not statistically significant (*Mean difference* = .71, $p = 0.140$). Statistically significant differences between early, middle and late adolescents for participation in Anonymous venues was also found: $F(4, 710) = 6.96$, $p < .001$. However, the post hoc analyses failed to reveal any significant differences for these variables. There does not appear to be a difference between categorizing the online environments according to anonymity as opposed to assessing group differences according to the medium itself.

Regarding Synchronicity, statistically significant differences between males and females were found: $F(2,355) = 9.95$, $p < .001$. Males tended to use both synchronous and asynchronous venues more than females (*M* for males = 8.178, 4.638 respectively, and *M* for females = 5.69, 3.75 respectively, $p < .01$). Furthermore, significant differences between early, middle and late adolescents for participation in synchronous and asynchronous mediums were found: $F(4, 710) = 5.40$, $p < 0.001$. Post hoc analyses determined that middle adolescents used asynchronous environments more than later adolescents (*M* early adolescence = 5.16, *M* late adolescence = 3.89, $p < .05$). There does not appear to be a difference in conceptualizing online environments according to

synchronicity as opposed to thinking about group differences according to the online venue itself.

Research Question 3: Online Engagement and Self-Concept

Hierarchical multiple regression analyses were performed to examine how online dimensions influenced domain and global self-concepts. Each aspect of self-concept was, in turn, the dependent variable, and was regressed by gender and age (to control for differentiation among these constructs) in the first block. In addition, for Email and IM, which are highly language dependent, native language was entered as a control variable. The Known vs. Unknown and Dimension variables (Social & Importance) were entered in the second and third blocks, respectively, to identify the unique prediction of these variables on self-concept. Finally, in the fourth block the interactions of the Known vs. Unknown and the Dimension variables were entered.

MORPGs

The regression models were not significant for self-conceptions of physical appearance, and opposite sex relations, thus indicating that MORPGs participation had little influence on adolescent self-conceptions of his/her physical appearance or their opposite sex relations.

Physical Abilities. After the control variables were entered, the Known vs. Unknown and the Dimension variables were entered. As can be seen in Table 3, the Dimension variables significantly added to the explanatory power ($R^2 = .178$, *change in* $R^2 = .147, p < .001$). A significant negative coefficient was found for the Social Dimension ($B = -.372$, *partial r* $= -.274, p < .01$), indicating that, as participation in this online venue becomes more social, adolescents have lower self-conceptions of their

physical abilities. The interactions were entered into block 4, but did not significantly contribute to the model. All subsequent regressions involved the same structure (as exemplified in Table 3). In the interest of space, only the significant coefficients and R^2s are presented for the remaining regressions.

Same Sex Relations. After entering the control variables, the Known vs. Unknown and Dimension variables were added. Again, the Dimension variables contributed significantly to the explanatory power ($R^2 = .140$, R^2 *change* $= .083$, $p < .01$). After assessing the variables separately, significant positive coefficients were found for the Known vs. Unknown variable ($B = .318$, *partial r* $= .208$, $p < .05$). Additionally, significant main effects were found for the Social Dimension ($B = -.431$, *partial r* $= -.219$, $p < .05$) where an increase in MORPGs use for social reasons results in lower self-conceptions of same sex relations. When the interaction variables were entered into the fourth model, significant contributions were made to the explanatory power ($R^2 = .184$, change in $R^2 = .044$, $p < .05$). Only a significant positive main effect was found for Known vs. Unknown variable ($B = 1.27$, *partial r* $= .281$, $p < .01$), where adolescent self-conceptions of same sex relationships were higher as his/her participation in MORPGs with people they knew offline increased (See Table 4).

General Self-Concept. After entering the control variables, significant contributions to the explanatory power were found when the Dimension variables were entered into block 3 ($R^2 = .183$, *change in* $R^2 = .011$, $p < .001$). As can be seen in Table 5, significant negative coefficients were found for the Social Dimension ($B = -.328$, *partial r* $= -.289$, $p < .001$), demonstrating that an adolescent's general self-concept were

lower as his or her participation in MORPGs become more social. The interactions were entered into block 4, but did not significantly contribute to the model.

Chatrooms

The regression models were not significant for physical ability, physical appearance or same sex relations.

Opposite Sex Relations: As shown in Table 6, the only significant change in R^2 was in the final block when the interaction effects were entered into the model. These variables explained an additional 19% of the variance (significant at $p < .001$; $R^2 = .22$). When the explanatory variables were examined individually, main effects for the Social Dimension ($B = 2.008$, *partial r* $= 0.391$, $p < 0.001$), and the Importance Dimension ($B = -1.861$, *partial r* $= -0.418$, $p < 0.001$) were found. Additionally, the interaction effect for Known vs. Unknown by Social Dimension was significant ($B = -2.871$, *partial r* $= -0.421$, $p < 0.001$). The interaction effects are presented in Figure 1 and demonstrate that individuals who primarily chat with people they do not know have higher self-conceptions of opposite sex relations than those who chat with people they do know, and self-conceptions in this domain are higher as reasons for chatting in Chatrooms becomes more social. Conversely, individuals who chat with people they do know offline start with lower self-conceptions of opposite sex relations and these self-conceptions are lower as social reasons for chatting increase. Significant interaction effects for Known vs. Unknown by Importance were also found ($B = 2.195$; *partial r* $= 0.422$; $p < 0.001$). As can be seen in Figure 2, adolescents who primarily chat with people they know offline start with higher self-conceptions of opposite sex relations and self-conceptions in this domain are higher as the importance they place on Chatrooms increases. On the other

hand, those who are chatting with people they do not know have lower self-conceptions of opposite sex relations as the importance they place on Chatrooms increases.

General Self-Concept. For this regression model, only the main effect model (block 3) significantly improved the variance explained (*change in R^2* = .19, significant at *p*< .001). When the explanatory variables were examined individually for this model (R^2 = .20), social importance was significant (B = -.51; *partial r* = -0.41, *p* < .001), suggesting that general self worth is lower as social importance increases. The addition of the interaction effects in block 4 did not improve the fit of this model (See Table 7).

IM

The regression models were not significant for physical abilities or physical appearance.

Opposite Sex Relations. After the control variables and the Known vs. Unknown variable were entered into the model, the Dimension variables were entered into the third block and made significant contributions to the explanatory power (R^2 = .085, R^2 *change* = .022, *p* <.05), as shown in Table 8. Significant negative coefficients were found for the Social Dimension (B = -.355, *partial r* = -.151, *p* < .05) indicating that adolescent's self-perceptions of his/her opposite sex relations are lower as his or her reasons for participation on IM becomes increasingly more social. Interaction variables were entered in the fourth block but they did not significantly account for any variance in the model.

Same Sex Relations. After controlling for gender, stage of adolescence and language spoken at home in block one, the Known vs. Unknown variable was entered in block 2 and significantly contributed to the model (R^2 = .101, R^2 *change* = .068, *p* < .001) (See Table 9). Significant positive coefficients (B = .586, *partial r* = .265, *p* < .001)

indicate that adolescents' self-conceptions of her same sex relations are higher when they communicate over IM with people that they know offline. Dimension and Interaction variables were entered into blocks three and four, but did not significantly add anything to the model.

General Self. Similar for this regression, the Known vs. Unknown variable made significant contributions to the explained variance ($R^2 = .107$, R^2 *change* $= .086$, $p < .001$). Significant positive coefficients for Known vs. Unknown ($B = .383$, *partial r* $= .296$, $p < .001$) demonstrate higher general self-conceptions as adolescents communicate over IM with people they know offline. Dimension and Interaction variables were entered into the third and fourth block but did not make any significant contributions to the model (Refer to Table 10).

Email

Physical Abilities. As shown in Table 11, after the control variables were entered into block 1, the Known vs. Unknown variable was entered into the second block. This variable contributed significantly to the model ($R^2 = .052$, R^2 *change* $= .030$, $p < .01$). Significant positive coefficients were found ($B = .216$, *partial r* $= .175$, $p < .01$) indicating that self-conceptions of physical abilities are higher as Email communication with offline friends increase. The Dimension and Interaction variables were entered into the fourth block but did not yield significant results.

Physical Appearance. Similarly for this regression, the Known vs. Unknown variable made significant contributions to the explanatory power ($R^2 = .044$, R^2 *change* $= .020$, $p < .05$). A significant positive coefficient was found for the main effect ($B = .189$, *partial r* $= .142$, $p < .05$) suggesting that self-conceptions of physical appearance are

higher as adolescents increasingly communicate over Email with people they know offline (See Table 12).

Opposite Sex Relations. For this regression, significant contributions were again made by the Known vs. Unknown variable (R^2 = .064, R^2 change = .019, p < .05). As illustrated in Table 13, positive coefficients were found (B = .332, *partial r* = .141, p < .05) demonstrating that as communication with people who are known offline increases, so does self-conceptions of opposite sex relations. No significant contributions were made to the model when the Dimension and Interaction variables were added.

Same Sex Relations. A similar pattern was also found for this regression (See Table 14). After the control variables were entered into the model, the variable Known vs. Unknown was entered into block 2. Significant main effects were found for this model (R^2 = .122, R^2 change = .088, p < .001). The coefficients were found to be positive (B = .533, *partial r* = .303, p < .001), indicating that adolescents who communicate over Email with people they know offline have higher self-conceptions of same sex relations. When Dimension and Interaction variables were added in block three and four, no significant contributions were made.

General Self-Concept: Finally, for general self-concept, when the Known vs. Unknown variable was added in block 2, the model was significantly improved (R^2 = .063, R^2 change = .041, p < .001). As can be seein in Table 15, significant positive coefficients (B = .211, *partial r* = .205, p < .001) indicate that general self-concept is higher when adolescents communicate over Email with people they know offline. Additionally, when the interaction variables were entered into block 4, an additional 5% of the variance was explained (R^2 = .128, R^2 change = .054, p < .001). When the

explanatory variables were examined separately, main effects for the Social Dimension (B = -1.32, *partial r* = -.239, p < .001), and the Importance Dimension (B = .994, *partial r* = .215, p < .001) were found. Additionally, significant interaction effects for Known vs. Unknown by the Social Dimension was found (B = .274, *partial r* = .223, p < .001). The interaction effects are illustrated in Figure 3 and indicate that adolescents who primarily communicate over Email with people they know offline have higher general self-conceptions than those who communicate with people they do not know offline, and these self-conceptions continue to increase as they use Email for social purposes. Conversely, adolescents who communicate over Email with people they do not know offline start with lower general self-conceptions than those who Email people they do know offline, and these self-conceptions lower when their reasons for Emailing become more social. Significant interaction effects for Known vs. Unknown by Importance were also found (B = -.223, *partial r* = -.217, p < .001). As shown in Figure 4, adolescents who Email people they know offline start off with slightly lower general self-conceptions, than those who Email people they do not know, and these self-conceptions are lower as importance for Email communication increases. Conversely, a positive relationship exists for adolescents who communicate over Email with people they do not know offline, where general self-conceptions are higher as more importance is placed on this venue.

Newsgroups/Forums

The model was not significant for physical ability, physical appearance or opposite sex relations; thus indicating that Newsgroup/Forum participation had little

influence on adolescent self-conceptions of the physical appearance or his opposite sex relations.

Same Sex Relations. As illustrated in Table 16, when the Importance Dimension variables were entered in block 3 they significantly added to the explanatory power (R^2 =.13; *change in R^2* = .12, $p < .01$). A significant negative coefficient was found for the Importance Dimension (B = -0.248, *partial r* = -0.227, $p < .05$), indicating that as more importance is placed on this online venue, self-concept in same sex relations is lower. Additionally, when the Dimension and interaction variables were entered into block 4, an additional 7% of the variance was explained (R^2 = .193, R^2 *change* = .065, $p < .05$). When the explanatory variables were examined independently, main effects for the Social Dimension (B = -.925, *partial r* = -.248, $p < .005$) were found. Additionally, significant interaction effects for Known vs. Unknown by the Social Dimension was found (B = .277, *partial r* = .225, $p < .05$). The interaction effects are illustrated in Figure 5 and indicate that adolescents who know the people they are communicating with in this online venue start off with higher self-conceptions of same sex relations. These self-conceptions remain high as the purpose for using this Newsgroup/Forum becomes more social. Alternatively, individuals who communicate in this venue with people they do not know have lower self-conceptions in this domain as participation becomes more social in nature. Significant interaction effects were also found for Known vs. Unknown by the Importance Dimension (B = -.238, *partial r* = -.231, $p < .05$). As shown in Figure 6, adolescents who know who they are communicating with over Newsgroups/Forums start with lower self-conceptions of same sex relations than those who do not know who they are communicating with, and these self-conceptions are even lower as more importance is

placed on the venue. The same effect occurs for those who do not know who they are communicating with in this venue.

General Self. Similarly, for this regression, the Dimension variables significantly added to the explanatory power of the model (R^2 =.15, *change in* R^2 = .13, p < .001) (See Table 17). Negative correlations were found for the Social Dimension (B = -0.389, *partial r* = -0.337, p < .001), indicating that as social aspects increase, general self-conceptions decrease. The interactions were added in block 4 and significantly contributed to the explanatory power (R^2 = .211, R^2 *change* = .059, p < .05). After assessing the variables separately, main effects for the Social Dimension (B = -.522, *partial r* = -.244, p < .05) and the Importance Dimension (B = .334, *partial r* = .223, p < .05) were found. Additionally, interaction effects for Known vs. Unknown was discovered (B = -.156, *partial r* = -.262, p < .05). As shown in Figure 7, adolescents who communicate over Newsgroups/Forums with people they know offline start with slightly lower general self-conceptions, and these self-conceptions are even lower as participation in this Forum becomes more important to them. Alternatively, those who do not know who they are communicating with in this environment have higher general self-conceptions as more importance is placed on this venue.

In summary, the people with whom adolescents communicated with over IM and Email had a positive influence on their domain and general self-conceptions. More specifically, adolescent self-conceptions were higher if his/her communication over IM and over Email was with offline friends. Conversely, for MORPGs, Chatrooms, and Newsgroups/Forums, self-conceptions seemed most influenced by the degree to which the venue was used for social purposes and the degree of importance the adolescent

placed on that medium. In considering the interaction effects, the patterns are less clear. The main pattern appears to be that adolescents who participate in chatrooms were influenced in a way that is in direct opposition to adolescents who communicate over Email or Newsgroups/Forums. For example, for Email and Newsgroups/Forums, a positive relationship existed between self-concept and online venue use for social reasons, for adolescents who communicated with people they knew offline. The inverse of this relationship was found for Chatroom participants.

Research Question 4: Online Self-Concept as Moderator

To address the fourth research question, hierarchical multiple regressions were performed to examine how online activity moderates the relationship between the physical and social domains of self-concept and overall self worth. The existence of possible moderational effects were examined in accordance with the procedures established Baron and Kenny (1986) and Holmbeck (1997).

Initially, all independent variables and the moderater variables were centered to eliminate problematic multicollinearity effects between independent variables and moderators. Then, a series of regressions were run, one for the effects of each self-concept domain on each medium of online participation. That is, independent regressions were run on physical abilities, physical appearance, opposite sex relations, same sex relations, and social relations (mean of opposite sex and same sex relations) for MORPGs, then Chatrooms, then IM, then Email, and, finally, Newsgroups/Forums. Predictor and moderator main effects, as well as stage of adolescence and gender, were entered into the equation first. Primary language spoken at home was also added as a covariate for IM and Email, since communication via these venues is based heavily on

language. Domain specific self-conceptions offline and online were added next, in a second block. Finally, the interaction between the independent variable (offline domain specific self-concept) and the moderator (online domain specific self-concept) were entered into the equation (Please see Table 18 for an example of the regression model).

MORPGs. Significant interaction effects were found for self-conceptions of physical appearance, opposite sex relations, same sex relations, and social relations (Please see table 19 for a summary of the coefficients), indicating that these online domain specific self-conceptions acted as a moderator between offline self-conceptions in this domain and general self-concept. In all cases, individuals with high online domain specific self-conceptions started with lower general self-conceptions than individuals with lower online self-conceptions. These self-conceptions were higher as their offline self-conceptions increased for self-conceptions of physical appearance, same sex relations, and social relations (See Figure 8 for an example). Self-conceptions remained relatively stable for self-conceptions of opposite sex relations (See Figure 9). For adolescents with lower self-conceptions of online domain specific self-conceptions, lower general self-conceptions were also found as their offline domain self-conceptions increased.

Chatrooms. Online self-conceptions of opposite sex relations, same sex relations, and social relations acted as a moderator between offline self-conceptions in these domains and general self-concept (Refer to Table 19 for a summary of the regression coefficients). Individuals with higher online self-conceptions started with lower general self-conceptions than those with lower online self-conceptions, and these self-conceptions generally increased as their offline domain specific self-conceptions

increased (with the exception of opposite sex relations where no significant change was found). Conversely, adolescents with lower domain specific online self-conceptions experienced a decrease in general self-concept as their offline self-conceptions increased (See Figure 10 for an example of these relationships).

IM. No moderational effects were found for this online venue.

Email. Online self-conceptions of physical appearance was found to be the only moderator between offline self-concept and general self-concept ($R^2 = .456$, R^2 *change* = .013, $p < .01$; $B = .146$, *partial r* = .151, $p < .01$). Individuals with higher self-conceptions of online physical appearance started with lower general self-conceptions that those who reported lower online self-conceptions in this domain. General self-conceptions, however, were found to be higher for both groups of adolescents, when offline self-conceptions of physical appearance was high (See Figure 11).

Newsgroups/Forums. The only moderator between offline self-concept in this domain and general self-concept was online self-conceptions of opposite sex relations ($R^2 = .222$, R^2 *change* = .039, $p < .05$; $B = .067$, *partial r* = .220, $p < .05$). Adolescents with higher online self-conceptions in this domain started with lower general self-conceptions, than those with lower online self-conceptions of opposite sex relations, but these self-conceptions were found to be higher when their self-conceptions of their offline opposite sex relations where high. Conversely, those with lower online self-conceptions in this domain had lower general self-conceptions when their offline self-conceptions of opposite sex relations were high (See Figure 12).

In summary, with the exception of IM, moderation effects were found for all the online environments. Overall, a positive relationship between domain and general self-

concept was found for adolescents with high online self-conceptions, while an inverse relationship between domain and general self-concept existed for those with lower online self-conceptions.

Research Question 5: Online Self-Concept as Mediator

The final set of analyses examined the possibility that online activity mediated the relationship between the physical and social domains of self-concept and overall self worth. In order for a variable to be considered a mediator, four conditions must be met (Baron & Kenny, 1986): a) the predictor (offline domain specific self-concept) must be significantly associated with the hypothesized mediator (online domain specific self-concept), (b) the predictor must be significantly associated with the dependent variable (general self-concept), (c) the mediator and the dependent variable must be significantly associated with each other, and (d) the impact of the predictor (offline domain specific self-concept) on the dependent variable (general self-concept) must be less when the mediator (online domain specific self-concept) is controlled for.

A four stage process was designed to evaluate the presence of mediators in this sample. In the first stage, a regression was conducted to assess the association of the predictor and the dependent variable; as such, offline domain specific self-concept was entered into the equation and online domain specific self-concept acted as the dependent variable. If this relationship was found to be significant, then a second regression was performed with offline domain specific self-concept as the independent variable and with global self-concept as the dependent variable. The existence of a significant relationship between these variables permitted the execution of a third regression with offline domain specific self-concept in the first block, offline domain specific self-concept in the second

block and global self - concept as the dependent variable. Finally, if this relationship was found to be significant, a final regression was performed, where online domain specific self-conceptions are controlled for in block 1, offline domain specific self-conceptions are entered next in block 2, and general self-concept as the dependent variable. If the change in R^2 for the final regression is lower than the change in R^2 for the second regression, and the difference between the changes in R^2 is close to zero, the predicting variable can be considered a mediator. For all regressions, gender and stage of adolescence acted as covariates. The first stage regression analyses were performed for all the self-concept domains (physical abilities, physical appearance, opposite sex relations, same sex relations, and social relations in general). In total, five self-conceptual domains yielded statistically significant outcomes for all four stages of the mediation analyses: IM physical abilities and appearance, Email physical abilities and appearance, and Newsgroups/Forums physical abilities.

IM Physical Abilities and Appearance Self-Conceptions

Self-conceptions of IM Physical Abilities as a mediating factor between offline self-conceptions in this domain and general self-concept were confirmed (See Table 20). The differences between the change in R^2 for the second regression (R^2 *change* = 0.277) and the fourth regression (R^2 *change* = 0.209) was found to be 0.068; thus, indicating that the impact IM self-conceptions of physical abilities on offline self-conceptions of physical abilities on general self-concept is moderately strong.

Self-conceptions of IM Physical Appearance as a mediator between offline self-conceptions of physical appearance and general self-concept was also confirmed (See Table 21). The differences in the change in R^2 for the second (R^2 *change* = 0.359) and

the fourth regressions (R^2 *change* = 0.279) was found to be 0.08, suggesting a somewhat weak mediating influence of IM physical appearance on offline self-conceptions in this domain and general self-concept.

Email Physical Abilities and Appearance Self-Conceptions

Significant relationships were found for all four regression analyses for self-conceptions of Email physical abilities. The differences in R^2 change for the second and fourth models yielded an R^2 change difference of 0.092, indicating that the mediating influence of self-conceptions of Email physical abilities on offline self-conceptions in this domain and general self-concept is somewhat weak. Table 22 illustrates a complete summary of this mediation analyses.

Significant relationships, for all four regression analyses, were also found for self-conceptions of Email physical appearance. The difference in R^2 change for the second model (R^2 *change* = 0.359) and the fourth model (R^2 *change* = 0.298) was found to be 0.061. This difference implies that the mediating influence of Email self-conceptions of online physical abilities on offline self-conceptions in this domain and general self-concept are moderately strong (See Table 23).

Newsgroup/Forum Physical Abilities Self-Conceptions

The significant relationships for all four regression analyses, and the differences between the changes in R^2 for the second and fourth regression analyses, confirms that self-conceptions of Newsgroup/Forum physical abilities mediates or suppresses the effects of offline self-conceptions of physical appearance on general self-concept. The difference in R^2 between the two models was found to be 0.109, indicating the mediating

influence of Newsgroups/Forum self-conceptions of physical abilities is relatively weak (See Table 24).

In summary, self perceptions of online physical abilities acted as mediating factors for IM, Email and Newsgroups/Forums. In other words, if an individual has low self perceptions of her physical abilities offline, her online self perceptions of her physical abilities, in these online venues, suppresses the impact of these conceptions on general self-concept. Additionally, online self perceptions of physical appearance acted as a mediating factor for IM and Email, but not for Newsgroups/Forums, so that an individual's online self-perceptions of his physical appearance will suppress the impact of the lower offline self-conceptions on general self-concept. Online social perceptions did not act as a mediating factor for any of the online venues.

Discussion

The purpose of this study was to explore the relationship between adolescents' online engagement across five different online venues, and their self-concept in five self-conceptual domains. More specifically, this study sought to confirm gender and age differences in online venue participation, investigate the relationship of online engagement on domain specific and global self-concepts, uncover the existence of moderating and mediating influences of online domain self-conceptions on offline domain self-conceptions on general self-concept. Overall, the findings confirm the existence of gender and age differences in online participation, as well as support the existence of a relationship between online engagement and self-concept, and confirm the moderational and mediational influences of online domain specific self-conceptions on offline self-conceptions.

Research Question 1: Gender and Age differences in Online Venue Participation

Consistent with previous literature (Environics Group, 2002; Subrahmanyam et.al. 2001), males reported playing MORPGs significantly more than girls. Males in this sample also reported spending more time in Chatrooms and Newsgroups/Forums than females did. Female participants reported spending more time communicating over Email than their male counterparts. Overall, Internet use is prevalent among both genders: on average, adolescents spent between 2 and 5 hours a week in the five online venues, with the more private ones, such as Email and IM, being favored over the more public venues. Moreover, only 1% of participants reported that they had never participated in any of the five online venues.

For three of the online venues, MORPGs, Email and IM, patterns of usage changed over time: as adolescents grew older, MORPGs and Email use decreased, while IM use increased. Given that previous research has demonstrated that adolescents become more social with age (Savin-Williams & Berndt, 1990), it is not surprising that early adolescents spent more time in a gaming venue while older adolescents spent more time communicating in a more social environment. Another potential reason for the decrease in MORPGs use with age is that older adolescents may view the gaming environment as a childish activity and participate in this venue less frequently. Of course, empirical research must be conducted to confirm this hypothesis. The decrease in Email use between middle and late adolescents may be indicative of a move toward a more synchronous online medium where individuals can discuss personal, academic, or other topics, in a more real time venue. The absence of significant age differences for Chatrooms and Newsgroups/Forums may be due to the low n for both of these venues.

More accurate findings may be obtained with a larger sample size. In general, these results demonstrate that participation in online venues is an important aspect of the lives of adolescents in 21st century urban Canada.

Research Question 2: Anonymity and Synchronicity

The exploration of whether categories of online environments represent a better way of conceptualizing online participation than examining the individual media themselves yielded equivocal results. Although it was expected that conceptualizing online venues in terms of Anonymity would be useful for distinguishing age and gender differences, the results tend to suggest it is not. It is important to note that these findings do not imply that no age or gender differences exist in terms of whether adolescents interact with preexisting friends or people they only know online, as they use the Internet. Instead, these results demonstrate that attempting to capture this aspect of online participation via categorization of the five different media is ineffective. Researchers who are interested in whom adolescents interact with online may do better to ask that question directly, rather than attempt to infer it from the kind of online venues in which adolescents participate. Although the Synchronous versus Asynchronous categorization scheme yielded significant gender and age differences, categorizing online venues in this way does not seem accurate since, with the exception of IM and Email (where females only slightly dominated over males), males used all the environments significantly more than females.

Research Question 3: Online Engagement and Self-Concept

On the basis of previous research indicating that adolescence is a time when individuals place high value on friendships and feelings of acceptance by others, it was

hypothesized that domain specific and global self-conceptions would be higher as online venue use for social reasons increased, and as greater importance was placed on that venue. This hypothesis was largely unsupported by the results pertaining to social usage of online venues, and only partially supported by the results pertaining to subjective importance.

Specifically, the only online venue where self-conceptions were higher as online venue use for social reasons increased was the use of Chatrooms. In fact, for MORPGs, Email and Newsgroups/Forums, data support the existence of an inverse relationship between online participation and self-concept rather than a positive one. The reason behind this unanticipated relationship is unclear. Perhaps individuals who have few offline friends attempt to seek comfort and peer acceptance by using MORPGs, Email or Newsgroups/Forums, but are rebuffed online just as they are in the offline world, thus leading to further declines in general self-concept. Alternatively, perhaps time spent in these venues, particularly MORPGs and Newsgroups, is time taken away from opportunities to develop offline friendships, so that it is the adolescents who tend to participate less in these online venues that have greater success at developing the social relations that allow them to feel better about themselves. Clearly, these issues require further exploration.

Apart from self-conceptions of opposite sex relations, the failure to find any kind of relationship between social use of IM and self-concept is intriguing. If this finding is confirmed in replication, it would mean that IM may simply be used as an alternative to the telephone (i.e., using IM to set up a time to hang out, to gossip, to discuss homework, to talk about nothing) as opposed to a unique form of communication among adolescents.

For the issue of subjective importance, the hypothesis that self-conceptions would increase as online venue use became more important to adolescents held for Email and Newsgroups/Forums. Therefore, it would appear that, at least for some kinds of online environments, the importance adolescents place on their online venue participation has an influence on their self-concept.

The finding that the opposite effect held true for Chatrooms (i.e., importance was negatively related to self-concept) was surprising. This venue may be particularly associated with the development of Internet addiction so that, unlike the use of Email or Newsgroups, adolescents who place excessive importance on communication in Chatrooms are also the ones who are more vulnerable to physical (blurred vision, loss of sleep), psychological (distress), social (less time spent interacting with peers and family) and other problems that are linked to Internet addiction, or PIU (Wang, 2001). Of course, empirical study is required to confirm the link between Chatrooms and Internet addiction, to say nothing of whether the subjective importance of this venue is an indicator of that addiction.

Equivocal results were found regarding the interactions between communicating with people they know or do not know offline and the nature of that communication (whether social or task-oriented) on self-concept, as well as the interaction between participating online with people they know or do not know offline and the importance placed on that participation. The finding that self-concept was inversely related to social reasons, for participants who communicated in Chatrooms primarily with people they knew offline, while self-concept was positively related to social reasons for those who participated with people they only knew in the virtual world, indicates that, in Chatrooms,

communicating anonymously for social reasons works to increase self-conceptions of opposite sex relations. One speculation is that adolescents who have lower self-conceptions in this domain use the anonymous interactive nature of Chatrooms to develop their opposite-sex social skills because they find it easier to interact with and gain the acceptance of members of the opposite sex in the online world, than in face-to-face conversations.

The opposite relationship that was found for Email and Newsgroups/Forums (i.e. self-concept was positively related to social reasons when participating with known people, and self-concept was negatively related to social reason when participating with unknown people) suggests that, when it comes to asynchronous venues, communicating with pre-existing friends from the offline world can increase one's self-concept. Future research is needed to not only replicate these findings, but examine the factors that are accounting for this finding.

With respect to the interactions between Known vs. Unknown and the importance placed on Chatrooms (i.e. self-conceptions of opposite sex relations increased as greater importance increased, for those who knew who they were communicating with offline; the inverse relationship was found for those who did not know who they were communicating with online), it seems evident that adolescents who know who they are communicating with in the Chatrooms place higher importance on this venue have higher self-conceptions in this domain. The opposing finding that was discovered for Email and Newsgroups/Forums (i.e. decrease in self-concept as greater importance was placed on the venue, for adolescents who communicated with primarily with people they knew offline, and an increase in self-concept as importance for the online venue increased, for

adolescents who communicated primarily with people they did not know) suggests that adolescents would benefit more self-conceptually by communicating with people they do not know and by placing high importance on the online venue.

Although these findings are somewhat ambiguous, there does seem to be a pattern emerging that Chatrooms represent a unique form of online communication. It is also interesting that this is one of the least popular online activities. Future research needs to explore which adolescents are utilizing this online venue and why. It is possible that the unique findings found for Chatrooms has to do with pre-existing dispositional characteristics among adolescents participating in this type of online venue.

In summary, the relationship between the importance placed on an online medium, or participating online for social reasons, differs according to the self-conceptual domain and according to which online venue an adolescent is participating. In future, it may be more beneficial to explore the nature of each online environment separately, since the consequences of participating in each online venue for subsequent adolescent development appears to be different for each specific type of participation.

Research Question 4: Online Self-Concept as Moderator

The hypothesis that individuals, with lower self-conceptions of physical appearance online and offline, would have lower general self-conceptions was supported for the Email venue, but not for the other online venues. In fact, for MORPGs, the opposite relationship was found (i.e., the moderation effects of having lower self-conceptions of physical appearance in MORPGs leads to a decline in general self-concept as offline self-conceptions in this domain increases). This latter finding is particularly troubling since it indicates that adolescents' online self-conceptions in this domain are

dictating the direction of their general self-concept. A possible explanation for this outcome is that individuals may be placing more self-conceptual weight on the physical appearance of their MORPGs character rather than their offline self-conceptions in this domain. Additionally, it is possible that adolescents are blurring their offline and virtual realities. The implications of this are serious since individuals who participate in this venue may be at higher risk for PIU, and other problems that may be associated with the blurring of realities. Clearly replication and more in depth study of this issue must be conducted.

The prediction that adolescents with high online and offline self-conceptions of their peer and social relations would have increasingly higher general self-conceptions was confirmed for MORPGs, Chatrooms, and Newsgroups/Forums. However, individuals with lower online self-conceptions in this domain experienced a decline in their general self-conceptions, even as their offline self-conceptions in this domain increased. In combination with the moderational effects for physical appearance, these findings suggest that the online self-conceptions determine the direction of adolescents' general self-concept.

Additionally, for all the online venues, negative beta coefficients for adolescents who have higher online self-conceptions created regression lines that started lower than adolescents who have lower online self-conceptions. For example, for all moderation effects, individuals who have higher online self-conceptions start with lower general self-conceptions. Despite these results, however, it is still clear that a positive relationship exists for individuals with high online self-conceptions and an inverse relationship exists for those with lower self-conceptions.

Research Question 5: Online Self-Concept as Mediator

The final set of hypotheses (i.e., that online self-concept mediates the relationship between domain specific self-concepts and general self-concept) was supported in the physical domain, at least for the IM, Email and Newsgroups/Forums venues. No significant mediating effects were found for any online venue in the peer or social self-conceptual domains. It is apparent from these findings that, at least for some forms of online participation, general self-concept can be improved if adolescents have higher online self-conceptions of their physical abilities/appearance. The implications of this finding is that adolescents may find solace and confidence in communicating with others online because the virtual environment protects them from displaying their physical abilities and appearance; self-conceptual domains that adolescents are particularly sensitive about. Additionally, adolescents may feel more comfortable communicating in these venues because they do not have to worry about what others may think of their physical appearance or abilities, and so can act more like themselves. Of course, further research should confirm these predictions. The next questions that need to be addressed are why certain online venues function as mediators while others do not, and what is it about the physical self-concept domain that lends itself to being affected by online participation.

Limitations

Several limitations of this study are important to recognize. First, although the overall sample size was relatively large ($N = 363$), participants were not evenly distributed across stage of adolescence (i.e., early, middle, and late adolescence) and across the different online venues examined in this study. The result of this is that the

power of the analytical procedures for detecting significant differences was probably weakened by the relatively few cases of some of the online venues (namely, Chatrooms and Newsgroups/Forums) and some of the age categories. Additionally, due to the uneven distribution of adolescents across the ages, it was required that participants be grouped according to stage of adolescence. Using year by year age changes would have allowed for a more fine grained understanding of how online participation changes over the course of adolescence. Future research should examine differences across these online venues with more evenly distributed sample sizes.

Third, the adolescents involved in this study reported relatively high levels of offline general self-conceptions. A possible explanation for this outcome is that adolescents in this study came from middle to upper class schools in mainland British Columbia, and are consequently at lower risk for experiencing external stresses that may come from being part of lower income families. The homogeneity of the sample limits the ability to generalize the findings from this study beyond high-functioning adolescents.

Fourth, the use of the primary language spoken at home variable as a control for cultural diversity may not accurately reflect English proficiency. For example, students with newly immigrated parents may primarily speak a language other than English at home, but this does not mean the student themselves are not proficient in English as well.

Finally, the cross-sectional nature of this study limits the ability to establish the direction of causality within the relationships. For example, some of the models in this study suggest that if adolescents participate online for social reasons, then they will experience a decrease in self-concept; however, it is equally possible that adolescents with lower self-conceptions frequent online venues to gain social acceptance.

Conclusion

Previous research on Internet use and its influence on adolescent development are few. This study has explored an area that has not yet been examined. Specifically, it has demonstrated that adolescent self-conceptions vary according to the online venue they participate in, who they are participating with, the importance they place on that participation, and whether they use that online medium for social or other reasons. Additionally, this study is the first to empirically verify the existence of moderational and mediational influences of online self-conceptions on offline self-concept and general self-concept. Although some results were ambiguous, the findings from this study can serve as a guide to future research by exemplifying the need for replication and the need to examine each online venue separately; as each environment seems to influence adolescent self-concept differently. Future research is imperative to better understanding this phenomenon, and this study is an initial step in advancing the knowledge base of adolescent development in a technologically progressive world.

References

Adams, G.R. (1977). Physical attractiveness, personality, and social reactions to peer pressure. *Journal of Psychology, 96,* 287-296.

Asher, S.R. & Rose, A.J. (1997). Promoting children's social-emotional adjustment with peers. In Peter Salovey & David J. Sluyter (Eds.). *Emotional development and emotional intelligence: Educational Implications.* (pp. 196-230).

Bargh, J.A., McKenna, K.Y.A., & Fitzsimons, G.M. (2002). Can you see the real me? Activation and expression of the "true self" on the Internet. *Journal of Social Issues, 58* (1), 33-48.

Baron, R.M. & Kenny D.A. (1986). The moderator-mediator variable distinction in social psychology research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51,* (6) 1173-1182.

Berndt, T.J. (1999). Friends' influence on students' adjustment to school. *Educational Psychologist 34* (1), 15-28.

Berryman, J. C., Smythe, P. K., Taylor, A., Lamont, A., & Joiner, R. (2002). *Developmental psychology and you* (2nd ed.). Oxford, UK: The British Psychological Society and Blackwell Publishers.

Birch, S.H., & Ladd, G.W. (1996). Interpersonal relationships in the school environment and children's early school adjustment: The role of teachers and peers. In J. Juvonen & K.R. Wentzel (Eds.), *Social motivation: Understanding children's school adjustment* (pp.199-225). Cambridge University Press.

Braken, B. (1996). *Handbook of Self-Concept: Developmental, Social, and Clinical Considerations.* Toronto, Canada: John Wiley & Sons, Inc.

Briggs, S.R., & Cheek, J.M. (1986). The role of factor analysis in the development and evaluation of personality scales. *Journal of Personality, 54,* 106-148.

Brooks-Gunn, J. (1987). Pubertal processes: Their relevance for developmental research. In V. B. Van Hasselt & M. Hersen (Eds.), *Handbook of adolescent psychology* (pp.111-130). New York: Pergamon.

Campbell, J. (1990). Self-esteem and clarity of self-concept. *Journal of Personality and Social Psychology,* 59 (3), 538-549.

Calber, s.L., & Tan S. (1994). Impact of virtual reality on young adults' physiological arousal and aggressive thoughts: interaction versus observation. *Journal of Applied Developmental Psychology, 15,* 125-139.

Case, R. (1995). Intellectual development: birth to adulthood. *New York: Academic Press.*

Chou, C., & Hsiao, M. (2000). Internet addiction, usage, gratification, and pleasure experience: the Taiwan college students' case. *Computers and Education 35,* 65-80.

Cohen, J. (2001). Social and emotional education: Core concepts and practices. In J. Cohen (Ed.) *Caring classrooms/intelligent schools: The social emotional education of young children* (pp.3-29). Teachers College Press.

Cole, D.A., Scott, M.E., Martin, J.M., Lachlan, P.G., Seroczynski, A.D., Tram, J.M., Hoffman, K.B., Ruiz, M.D., Jacquez, F., & Maschman, T. (2001). The development of multiple domains of child and adolescent self-concept: a cohort sequential longitudinal design. *Child Development, 72* (6), 1723-1746.

Colvin, C.R., & Block, J. (1994). Do positive illusions foster mental health? An examination of the Taylor and Brown Formulation. *Psychological Bulletin*, 116, (1), 3-20.

David, R.A., (2001). A cognitive-behavioral model of pathological Internet use. *Computers in Human Behavior 17*, 187-195.

Dietz-Uhler, B., & Bishop-Clark, C., (2001). The use of computer-mediated communication to enhance subsequent face-to-face discussions. *Computers and Human Behavior 17*, 269-283.

Environics Group (2001). *Young Canadians in a wired world: The students' view.* Retrieved from http://www.media-awareness.ca

Fischer, K.W. (1980). A theory of cognitive development: The control and construction of hierarchies of skills. *Psychological Review, 87*, 477-531.

Gross, E.F., Juvonen, J., & Gable, S.L. (2002). Internet use and well-being in adolescence. *Journal of Social Issues 58* (1), 75-90.

Haddock, B.L., & Sporakowski, M.J. (1982). Self-concept and family communication: A comparison of status and criminal offenders and non-offenders. *Journal of Offender Counseling, Services and Rehabilitation, 7*, 61-74.

Harris, J.R. (2000). Socialization, personality development, and the child's environments: comment on Vandell (2000). *Developmental Psychology, 36* (6), 711-723.

Harter, S. (1990a). Cause, correlates and the functional role of self-worth: A life-span perspective. In R.J. Sternberg & J. Kolligian (Eds.), *Competence considered* (pp. 67-97). New Haven: Yale University Press.

Harter, S. (1990b). Processes underlying adolescent self-concept formation. In R. Montemayer, G.R. Adams, & T.P. Gullotta (Eds.), *From childhood to adolescence: A transitional period?* (pp. 205-239). Newbury Park, CA: Sage.

Harter, S., (1990c). Adolescent self and identity development. In S.S. Feldman & G.R. Elliot (Eds.), *At the threshold: The developing adolescent* (pp. 352-387). Cambridge, MA: Harvard University Press.

Harter, S., (1993). Causes, correlates and the functional role of global self-worth: A life-span perspective. In J. Kolligian & R. Sternberg (Eds.), *Perceptions of competence and incompetence across the life-span* (pp. 67-98). New Have, CT: Yale University Press.

Harter, S. (1996). Historical roots of contemporary issues involving self-concept. In Braken, B. (Ed). *Handbook of Self-Concept: Developmental, social, and clinical considerations* (pp 1-37). Toronto, John Wiley & Sons, Inc.

Harter, S. (1999). *The construction of self: A developmental perspective.* New York, NY: The Guilford Press.

Harter, S., & Monsour, A. (1992). Developmental analysis of opposing self-attributes in the adolescent self-portrait. *Developmental Psychology, 28,* 251-260.

Holliday, L. (1999). Challenging questions about e-mail for language learning. *ESL Magazine 2* (2), 14-15.

Holmbeck, G.N. (1997). Toward terminology, conceptual, and statistical clarity in the study of mediators and moderators: Examples from the child-clinical and pediatric psychology literatures. *Journal of Consulting and Clinical Psychology, 65,* (4), 599-610.

Incan Monkey God Studios (2002). Issue #1. *Massively Online Gaming*, 1. Retrieved April 9, 2003, from http://www.mogonline.com

Kernis, M., Cornell, D.P., Sun, C., Berry, A., Harlow, T. (1993). There's more to self-esteem than whether it is high or low: The importance of stability of self-esteem. *Journal of Personality and Social Psychology, 65* (6), 1190-1204.

Kraut, R., Kiesler, S., Boneva, B., Cummings, J., Helgeson, V., & Crawford, A. (2002). Internet paradox revisited. *Journal of Social Issues 58* (1), 49-74.

Labouvie-Vief, G., Chiodo, L.M., Goguen, L.A., Diehl, M., & Orwoll, L. (1995). Representations of self across the life span. *Psychology of aging, 10* (3), 404-415.

Lapsley, D.K., & Rice, K. (1988). The "new look" at the imaginary audience and peroanl fable: Toward a general model of adolescent ego development. In D. K. Lapsley & F.C. Power (Eds.), *Self, ego, and identity: Integrative approaches* (pp.109-129). New York: Springer-Verlag.

Lavoritano, J.E., & Segal, P.B. (1992). Evaluating he efficacy of short-term counseling and adolescents in a school setting. *Adolescence, 27,* 535-543.

Lerner, R.M., & Karabenick, S.A. (1974). Physical attractiveness, body attitudes, and self-concept in late adolescents. *Journal of Youth and Adolescence, 3,* 307-316.

Lerner, R.M., Orlos, J.B., & Knapp, J.R. (1976). Physical attractiveness, physical effectiveness, and self-concept on late adolescents. *Adolescence, 11,* 313-326.

Lloyd, B.T. (2002). A conceptual framework for examining adolescent identity, media influence, and social development. *Review of General Psychology, 6* (1), 73-91.

Marsh, H.W. (1986). Global self-esteem: Its relation to specific facets of self-concept and their importance. *Journal of Personality and Social Psychology, 51,* 1224-1236.

Marsh, H.W. (1987). The hierarchical structure of self-concept and the application of hierarchical confirmatory factor analysis. *Journal of Educational Measurement, 24,* 17-19.

Marsh, H.W. (1990). Self Description Questionnaire II. *SDQ II Manual.*

Marsh, H.W. (1990b). The Structure of academic self-concept and academic self-concept: The marsh/Shavelson model. *Journal of Educational Psychology, 82, 623-636.*

Marsh, H.W., & Hattie, J. (1996). Theoretical perspectives on the structure of self-concept. In Bracken, B. (Ed). *Handbook of Self-Concept: Developmental, social, and clinical considerations* (pp 38-90). Toronto, John Wiley & Sons, Inc.

Marsh, H.W., & Shavelson, R. (1985). Self-concept: Its multifaceted hierarchical structure. *Educational Psychologist, 20,* 107-123.

McClurg, P.A., & Chaille, C. (1987). Computer games: environments for developing spatial cognition? *Journal of Educational Computing Research 3* (1), 95-111.

McKenna, K.Y.A., & Bargh, J.A. (1998). Coming out in the age of the internet: Identity "demarginalization" through virtual group participation. *Journal of Personality and Social Psychology 75.*(3), 681-694.

Morahan-Martin, J., & Schumacher, P. (2000). Incidence and correlates of pathological Internet use among college students. *Computers in Human Behavior 16,* 13-29.

Moretti, M.M. & Wiebe, V.J., (1999). Self-discrepancy in adolescence: Own and parental standpoints on the self. *Merrill-Palmer Quarterly 45* (4), 624-649.

Pallant, J., (2003). *SPSS Survival Manual.* Philedelphia, Open University Press.

Papini, D.R. & Farmer, F.F., (1990). Early adolescent age and gender differences in patterns of emotional self-disclosure to parents and friends. *Adolescence, 25,* 959-977.

Prout, H.T. & Prout S.M. (1996). Global self-concept and it's relationship to stressful life conditions. Theoretical perspectives on the structure of self-concept. In Bracken, B. (Ed). *Handbook of Self-Concept: Developmental, social, and clinical considerations* (pp 259-286). Toronto, John Wiley & Sons, Inc.

Rosenberg, M. (1979). *Conceiving the self.* New York: Basic Books.

Rosenberg, M. (1986). Self-Concept from middle childhood through adolescence. *Psychological Perspectives on the Self 3,* 107-135.

Russell, A.L., & Cohen, L.M. (1997). The reflective colleague in e-mail cyberspace: a means for improving university instruction. *Computers & Education, 29* (4), 137-145.

Ryckman, R.M., Robbins, M.A., Thornton, B., & Cantrell, P. (1982). Development and validation of a physical self-efficacy scale. *Journal of Personality and Social Psychology, 42,* 891-900.

Savin-Williams, R.C. & Berndt, T.J. (1990). Friendship and peer relations. In S.S. Feldman & G.R. Elliott (Eds.). *At the Threshold: The developing adolescent* (pp. 277-307).

Schonert-Reichl, K.A., & Hymel, S. (1996). Promoting social development and

acceptance in the elementary classroom. In J. Andrews (Ed.). *Teaching students with diverse needs* (pp.152-200). International Thomson Publishing Company.

Subrahmanyam, K., Greedfield, P., Kraut, R., & Gross, E. (2001). The impact of

computer use on children's and adolescents' development. *Applied Developmental Psychology, 22,* 7-30.

Taylor, S.E., & Block, J.D. (1988). Illusion and well-being: A social psychological

perspective on mental health. *Psychological bulletin, 103* (2), 193-210.

Taylor, S.E., & Block, J.D. (1994). Positive illusions and well-being revisited: separating

fact from fiction. *Psychological Bulletin, 116,* (1), 21-27.

Teri, L. (1982). Depression in adolescence: It's relationship to assertion and various

aspects of self-image. *Journal of Clinical Child Psychology, 11,* 101-106.

Thomas, D.R. (1992). Interpreting discriminant functions: A data analytic approach.

Multivariate Behavioral Research, 27, 335-362

Thomas, D. R., Hughes, E., & Zumbo, B. D. (1998). On variable importance in linear

regression. Social Indicators Research: An International and Interdisciplinary Journal for Quality-of-Life Measurement, 45, 253-275.

Turkle, S. (1995). *Life on the screen.* New York, NY: First Touchstone Edition.

Vandell, D.L. (2000). Parents, Peer Groups and other socializing influences.

Developmental Psychology, 36 (6), 699-710.

Wallace, P., (1999). *The Psychology of the Internet.* New York, NY: Cambridge

University Press.

Wang, W., (2001). Internet dependency and psychosocial maturity among college

    students. *International Journal of Human-Computer Studies 55*, 919-938.

Warschauer, M. (1996). Comparing face-to-face and electronic communication in the

    second language classroom. *CALICO Journal 13* (2), 7-26.

Wigfield, A., & Karpathian, M. (1991). Who am I and what can I do? Children's self-

    concepts and motivation in achievement situations. *Educational Psychologists,*

    26 (3&4), 233-261.

Wolak, J., Mitchell, K.J., & Finkelhor, D. (2003). Escaping or connecting?

    Characteristics of youth who form close online relationships. *Journal of*

    Adolescence, 26, 105-119.

Yu, F., & Yu H.J., (2002). Incorporating e-mail into the learning process: it's impact on

    student academic achievement and attitudes. *Computers and Education 38,* 117-

    126.

Table 1

Numbers of Male and Female Participants by Online Environment

Online Environment	Frequency Total (n = 363)	Males (n = 184)	Females (n = 179)
MORPGs	37%	58.7%	14.0%
Chatrooms	20%	26.1%	15.6%
IM	75%	71.7%	78.2%
Email	81%	75.5%	87.8%
Newsgroups/Forums	27%	37.5%	15.6%

Table 2

Estimated Marginal Means of Male and Female Time Spent in Online Environment by

Venue and Stage of Adolescence

	Gender					
	Male (n = 184)			Female (n = 179)		
Stage of Adolescence	M	SE	n	M	SE	n
MORPGs						
Early	3.22	.25	60	.83	.25	18
Middle	3.20	.31	33	.52	.30	6
Late	1.79	.46	12	.19	.53	1
Total n			105			25
Chatroom						
Early	1.21	.19	24	.85	.19	21
Middle	.97	.23	14	.39	.23	6
Late	.82	.34	7	.19	.40	1
Total n			45			28
IM						
Early	3.16	.32	53	4.25	.33	64
Middle	4.85	.41	48	5.61	.39	57
Late	5.3	.60	24	4.24	.69	14
Total n			125			135
Email						
Early	1.98	.16	63	2.65	.16	79
Middle	2.73	.20	50	3.2	.19	58
Late	2.29	.29	21	2.5	.34	16
Total n			134			153
Newsgroups/Forums						
Early	1.97	.28	29	.81	.28	12
Middle	3.05	.35	31	1.20	.34	13
Late	2.64	.52	11	.81	.60	3
Total n			71			28

Table 3

Summary of Hierarchical Regression Analyses: Self-Conceptions of Physical Abilities after playing MORPGs (N = 121).

Self-Conceptual Domains	B	SE	β	Partial r	R^2	$\triangle R^2$
Step 1					.01	.01
Gender	-.18	.19	-.08	-.08		
Middle adolescence	-.08	.15	-1.00	-.05		
Late adolescence	.08	.15	1.01	.05		
Step 2					.03	.02
Gender	-.19	.19	-.09	-.09		
Middle adolescence	-.13	.15	-1.66	-.08		
Late adolescence	.13	.15	1.68	.08		
Known vs. Unknown	.16	.10	.15	.13		
Step 3					.18	.15***
Gender	-.24	.18	-.11	-.12		
Middle adolescence	-.08	.14	-1.02	-.05		
Late adolescence	.09	.14	1.07	.05		
Known vs. Unknown	.13	.09	.12	.12		
Social dimension	-.37	.12	-.28	-.27**		
Importance dimension	-.17	.09	-.18	-.17		
Step 4					.18	.00
Gender	-.24	.18	-.11	-.12		
Middle adolescence	-.09	.15	-1.09	-.06		
Late adolescence	.09	.15	1.14	.06		
Known vs. Unknown	.23	.23	.21	.07		
Social dimension	-.33	.45	-.25	-.07		
Importance dimension	-.07	.28	-.07	-.02		
Known vs. Unknown X Social dimension	-.01	.12	-.04	-.01		
Known vs. Unknown X Importance dimension	-.03	.07	-.13	-.04		

Note. *p < 0.05.   **p < 0.01   ***p < 0.001.

Table 4

Summary of Hierarchical Regression Analyses: Self-Conceptions of Same Sex Relations after playing MORPGs (N = 121).

Self-Conceptual Domains	B	SE	β	Partial r	R^2	$\triangle R^2$
Step 1					.01	.01
Gender	.07	.28	.02	.02		
Middle adolescence	.19	.21	1.62	.08		
Late adolescence	-.19	.21	-1.65	-.08		
Step 2					.06	.05**
Gender	.04	.27	.01	.01		
Middle adolescence	.07	.21	.64	.03		
Late adolescence	-.08	.21	-.66	-.03		
Known vs. Unknown	.35	.14	.23	.22**		
Step 3					.14	.08**
Gender	-.00	.27	-.00	-.00		
Middle adolescence	.12	.21	1.03	.05		
Late adolescence	-.12	.21	-1.02	-.05		
Known vs. Unknown	.32	.14	.21	.21*		
Social dimension	-.43	.18	-.23	-.22*		
Importance dimension	-.16	.13	-.11	-.11		
Step 4					.18	.04*
Gender	.03	.26	.01	.01		
Middle adolescence	.06	.21	.52	.03		
Late adolescence	-.61	.21	-.53	-.03		
Known vs. Unknown	1.27	.40	.82	.28**		
Social dimension	.68	.65	.36	.10		
Importance dimension	.36	.39	.27	.08		
Known vs. Unknown X Social dimension	-.29	.17	-.69	-.16		
Known vs. Unknown X Importance dimension	-.14	.11	-.43	-.12		

Note. *p < 0.05. **p < 0.01 ***p < 0.001.

Table 5

Summary of Hierarchical Regression Analyses: General Self-Conceptions after playing MORPGs

(N = 121).

Self-Conceptual Domains	*B*	*SE*	*β*	*Partial r*	*R²*	*ΔR²*
Step 1					.00	.00
Gender	.03	.16	.02	.02		
Middle adolescence	.04	.12	.66	.03		
Late adolescence	-.05	.12	-.69	-.03		
Step 2					.04	.04*
Gender	.02	.16	.01	.01		
Middle adolescence	-.01	.13	-.18	-.01		
Late adolescence	.01	.13	.16	.01		
Known vs. Unknown	.18	.08	.20	.19*		
Step 3					.18	.14***
Gender	-.02	.15	-.01	-.01		
Middle adolescence	.02	.12	.35	.02		
Late adolescence	-.02	.12	-.34	-.02		
Known vs. Unknown	.15	.08	.17	.17		
Social dimension	-.33	.10	-.30	-.30***		
Importance dimension	-.12	.07	-.16	-.15		
Step 4					.19	.01
Gender	-.00	.15	-.01	-.01		
Middle adolescence	.01	.12	.09	.01		
Late adolescence	-.01	.12	-.10	-.01		
Known vs. Unknown	.40	.23	.45	.16		
Social dimension	.10	.37	.09	.03		
Importance dimension	-.08	.23	-.10	-.03		
Known vs. Unknown X Social dimension	-.11	.10	-.47	-.11		
Known vs. Unknown X Importance dimension	-.01	.06	-.10	-.02		

Note. *p < 0.05. **p < 0.01 ***p < 0.001.

Table 6

Summary of Hierarchical Regression Analyses: Self-Conceptions of Opposite Sex Relations after

Chatting in Chatrooms (N = 66).

Self-Conceptual Domains	B	SE	β	Partial r	R^2	$\triangle R^2$
Step 1					.01	.01
Gender	-.07	.50	-.02	-.02		
Middle adolescence	.32	.39	2.03	.10		
Late adolescence	-.32	.39	-2.10	-.10		
Step 2					.02	.01
Gender	-.06	.51	-.01	-.01		
Middle adolescence	.39	.40	2.52	.12		
Late adolescence	-.40	.40	-2.56	-.12		
Known vs. Unknown	.16	.22	.09	.09		
Step 3					.04	.02
Gender	-.08	.52	-.02	-.02		
Middle adolescence	.33	.41	2.10	.10		
Late adolescence	-.33	.41	-.21	-.10		
Known vs. Unknown	.16	.23	.09	.09		
Social dimension	-.27	.33	-.13	-.10		
Importance dimension	-.01	.31	-.04	-.03		
Step 4					.22	.19
Gender	-.18	.47	-.04	-.05		
Middle adolescence	.49	.37	3.13	.16		
Late adolescence	-.50	.37	-.32	-.17		
Known vs. Unknown	.82	.50	.47	.20		
Social dimension	4.30	1.3	2.01	.39***		
Importance dimension	-3.77	1.02	-1.86	-.12***		
Known vs. Unknown X Social dimension	-1.36	.37	-2.87	-.42***		
Known vs. Unknown X Importance dimension	1.16	.31	2.20	.42***		

Note. $*p < 0.05.$ $**p < 0.01$ $***p < 0.001.$

Table 7

Summary of Hierarchical Regression Analyses: General Self-Conceptions after Chatting in Chatrooms (N = 66).

Self-Conceptual Domains	B	SE	β	Partial r	R^2	ΔR^2
Step 1					.00	.00
Gender	.03	.22	.02	.02		
Middle adolescence	.04	.17	.66	.03		
Late adolescence	-.05	.17	-.69	-.03		
Step 2					.01	.01
Gender	.04	.22	.02	.02		
Middle adolescence	.08	.17	1.13	.05		
Late adolescence	-.08	.17	-1.18	-.06		
Known vs. Unknown	.07	.10	.09	.08		
Step 3					.20	.19***
Gender	.07	.20	.04	.04		
Middle adolescence	-.01	.16	-.19	-.01		
Late adolescence	.01	.16	.13	.01		
Known vs. Unknown	.10	.09	.13	.13		
Social dimension	-.47	.13	-.51	-.41***		
Importance dimension	.11	.12	.13	.11		
Step 4					.26	.06
Gender	.04	.20	.02	.03		
Middle adolescence	.02	.16	.32	.02		
Late adolescence	-.03	.16	-.42	-.02		
Known vs. Unknown	.03	.21	.03	.02		
Social dimension	.34	.53	.37	.08		
Importance dimension	-.82	.43	-.94	-.23		
Known vs. Unknown X Social dimension	-.24	.15	-1.17	-.19		
Known vs. Unknown X Importance dimension	.30	.13	1.32	.28*		

Note. *p < 0.05. **p < 0.01 ***p < 0.001.

Table 8

Summary of Hierarchical Regression Analyses: Self-Conceptions of Opposite Sex Relations after

Chatting over IM (N = 258).

Self-Conceptual Domains	B	SE	β	Partial r	R^2	$\triangle R^2$
Step 1					.05	.05
Gender	-.13	.26	-.03	-.03		
Middle adolescence	.23	.20	1.37	.07		
Late adolescence	-.22	.20	-1.39	-.07		
Home Language	.84	.27	.20	.19**		
Step 2					.06	.02*
Gender	-.17	.25	-.04	-.04		
Middle adolescence	.23	.20	1.50	.07		
Late adolescence	-.24	.20	-1.53	-.08		
Home Language	.80	.27	.18	.18**		
Known vs. Unknown	.40	.18	.13	.14*		
Step 3					.09	.02*
Gender	-.26	.26	-.06	-.06		
Middle adolescence	.22	.20	1.41	.07		
Late adolescence	-.22	.20	-1.44	-.07		
Home Language	.80	.27	.18	.18**		
Known vs. Unknown	.32	.18	.11	.11		
Social dimension	-.34	.15	-.16	-.15*		
Importance dimension	.15	.11	.10	.10		
Step 4					.10	.02
Gender	-.25	.26	-.06	-.06		
Middle adolescence	.21	.20	1.32	.07		
Late adolescence	-.21	.20	-1.34	-.10		
Home Language	.80	.27	.18	.18**		
Known vs. Unknown	1.25	.55	.42	.14*		
Social dimension	-.30	.99	-.13	-.02		
Importance dimension	1.59	.84	.91	.12		
Known vs. Unknown X Social dimension	-.02	.22	-.04	-.01		
Known vs. Unknown X Importance dimension	-.31	.18	-.88	-.12		

Note. *p < 0.05. **p < 0.01 ***p < 0.001.

Table 9

Summary of Hierarchical Regression Analyses: Self-Conceptions of Same Sex Relations after Chatting over IM (N = 258).

Self-Conceptual Domains	B	SE	β	Partial r	R^2	$\triangle R^2$
Step 1					.03	.03
Gender	.03	.19	.01	.01		
Middle adolescence	.12	.15	1.06	.05		
Late adolescence	-.12	.15	-1.08	-.05		
Home Language	.53	.20	.16	.16**		
Step 2					.10	.10***
Gender	-.04	.19	-.01	-.01		
Middle adolescence	.15	.14	1.31	.07		
Late adolescence	-.16	.14	-.136	-.07		
Home Language	.48	.20	.14	.15*		
Known vs. Unknown	.59	.13	.26	.27***		
Step 3					.12	.02
Gender	-.10	.19	-.03	-.03		
Middle adolescence	.14	.14	1.2	.06		
Late adolescence	-.15	.14	-1.29	-.07		
Home Language	.48	.20	.15	.15*		
Known vs. Unknown	.54	.13	.24	.24***		
Social dimension	-.23	.11	-.14	-.14*		
Importance dimension	.11	.08	.09	.08		
Step 4					.12	.01
Gender	-.09	.19	-.03	-.03		
Middle adolescence	.14	.14	1.20	.06		
Late adolescence	-.14	.14	-1.25	-.06		
Home Language	.48	.20	.15	.15*		
Known vs. Unknown	1.00	.41	.45	.15*		
Social dimension	.23	.73	.13	.02		
Importance dimension	.45	.61	.35	.05		
Known vs. Unknown X Social dimension	-.10	.16	-.29	-.04		
Known vs. Unknown X Importance dimension	-.075	.13	-.28	-.04		

Note. *p < 0.05.   **p < 0.01   ***p < 0.001.

Table 10

Summary of Hierarchical Regression Analyses: General Self-Conceptions after Chatting over IM

(N = 258).

Self-Conceptual Domains	B	SE	β	Partial r	R^2	$\triangle R^2$
Step 1					.02	.02
Gender	.01	.11	.01	.01		
Middle adolescence	.01	.10	.17	.01		
Late adolescence	-.01	.10	-.21	-.01		
Home Language	.27	.12	.14	.14*		
Step 2					.11	.10***
Gender	-.03	.11	-.02	-.02		
Middle adolescence	.03	.08	.46	.02		
Late adolescence	-.04	.08	-.52	-.03		
Home Language	.23	.11	.12	.12*		
Known vs. Unknown	.38	.08	.30	.30***		
Step 3					.12	.01
Gender	-.04	.11	-.02	-.02		
Middle adolescence	2.2	.08	.33	.02		
Late adolescence	-.26	.08	-.38	-.02		
Home Language	.23	.11	.12	.12*		
Known vs. Unknown	.36	.08	.28	.28***		
Social dimension	-.11	.06	-.11	-.11		
Importance dimension	.01	.05	.02	.01		
Step 4					.12	.00
Gender	-.04	.11	-.02	-.02		
Middle adolescence	.02	.08	.31	.02		
Late adolescence	-.02	.08	-.36	-.02		
Home Language	.23	.12	.12	.12*		
Known vs. Unknown	.47	.24	.37	.13*		
Social dimension	-.06	.42	-.06	-.01		
Importance dimension	.15	.36	.20	.03		
Known vs. Unknown X Social dimension	-.01	.09	-.06	-.01		
Known vs. Unknown X Importance dimension	-.03	.08	-.20	-.03		

Note. *p < 0.05.   **p < 0.01   ***p < 0.001.

Table 11

Summary of Hierarchical Regression Analyses: Self-Conceptions of Physical Abilities after

Communicating over Email (N = 285).

Self-Conceptual Domains	B	SE	β	Partial r	R^2	$\triangle R^2$
Step 1					.02	.02
Gender	-.20	.13	-.09	-.09		
Middle adolescence	-.11	.10	-1.40	-.10		
Late adolescence	.11	.10	1.41	.07		
Home language	.26	.14	.11	.11		
Step 2					.05	.03**
Gender	-.26	.13	-.12	-.12		
Middle adolescence	-.10	.10	-.12	-.06		
Late adolescence	.10	.10	1.26	.06		
Home language	.22	.14	.10	.10		
Known vs. Unknown	.22	.07	.18	.18**		
Step 3					.06	.01
Gender	-.26	.13	-.12	-.12		
Middle adolescence	-.12	.10	-1.50	-.07		
Late adolescence	.12	.10	1.51	.07		
Home language	.20	.14	.09	.09		
Known vs. Unknown	.21	.07	.17	.17**		
Social dimension	-.09	.08	-.08	-.07		
Importance dimension	.002	.06	.00	.00		
Step 4					.07	.01
Gender	-.26	.13	-.12	-.12*		
Middle adolescence	-.13	.10	-.167	-.08		
Late adolescence	.13	.10	1.68	.08		
Home language	.23	.14	.10	.10		
Known vs. Unknown	.20	.18	.17	.07		
Social dimension	-.71	.40	-.62	-.11		
Importance dimension	.47	.33	.56	.08		
Known vs. Unknown X Social dimension	.14	.09	.57	.10		
Known vs. Unknown X Importance dimension	-.10	.07	-.61	-.08		

Note. *p < 0.05. **p < 0.01 ***p < 0.001.

Table 12

Summary of Hierarchical Regression Analyses: Self-Conceptions of Physical Appearance after communicating over Email (N = 285).

Self-Conceptual Domains	B	SE	β	Partial r	R^2	$\triangle R^2$
Step 1					.02	.02
Gender	-.06	.14	-.03	-.03		
Middle adolescence	.02	.11	.22	.01		
Late adolescence	-.02	.11	-.19	-.01		
Home language	.38	.15	.15	.15		
Step 2					.04	.02*
Gender	-.12	.14	-.05	-.05		
Middle adolescence	.03	.11	.35	.02		
Late adolescence	-.03	.11	-.32	-.02		
Home language	.34	.15	.14	.14*		
Known vs. Unknown	.19	.08	.14	.14*		
Step 3					.05	.01
Gender	-.14	.14	-.06	-.06		
Middle adolescence	-.01	.11	-.07	-.00		
Late adolescence	.01	.11	.10	.01		
Home language	.33	.15	.13	.12*		
Known vs. Unknown	.18	.08	.13	.13*		
Social dimension	-.14	.08	-.11	-.10		
Importance dimension	.05	.06	.06	.05		
Step 4					.07	.02
Gender	-.14	.14	-.06	-.06		
Middle adolescence	-.03	.11	-.32	-.02		
Late adolescence	.03	.11	.34	.02		
Home language	.38	.15	.15	.15*		
Known vs. Unknown	.19	.20	.14	.06		
Social dimension	-.11	.43	-.89	-.15*		
Importance dimension	.80	.36	.88	.13*		
Known vs. Unknown X Social dimension	.22	.10	.81	.13*		
Known vs. Unknown X Importance dimension	-.17	.08	-.91	-.13*		

Note. *p < 0.05.   **p < 0.01   ***p < 0.001.

Table 13

Summary of Hierarchical Regression Analyses: Self-Conceptions of Opposite Sex Relations after

Communicating over Email (N = 285).

Self-Conceptual Domains	B	SE	β	Partial r	R^2	$\triangle R^2$
Step 1					.05	.05*
Gender	-.13	.24	-.03	-.03		
Middle adolescence	.21	.19	1.37	.07		
Late adolescence	-.23	.19	-1.39	-.07		
Home language	.84	.26	.19	.19***		
Step 2					.06	.02*
Gender	-.24	.25	-.06	-.06		
Middle adolescence	.23	.19	1.49	.07		
Late adolescence	-.24	.19	-1.51	-.07		
Home language	.78	.26	.18	.18**		
Known vs. Unknown	.33	.14	.14	.14*		
Step 3					.08	.01
Gender	-.27	.25	-.06	-.06		
Middle adolescence	.16	.19	1.01	.05		
Late adolescence	-.16	.19	-1.04	-.05		
Home language	.75	.26	.17	.17**		
Known vs. Unknown	.31	.14	.13	.13*		
Social dimension	-.28	.15	-.13	-.12		
Importance dimension	.10	.11	.06	.06		
Step 4					.08	.00
Gender	-.27	.25	-.07	-.07		
Middle adolescence	.16	.19	1.04	.05		
Late adolescence	-.17	.19	-1.07	-.05		
Home language	.765	.265	.17	.17		
Known vs. Unknown	.58	.35	.24	.10		
Social dimension	-.01	.76	-.01	-.00		
Importance dimension	.29	.64	.18	.03		
Known vs. Unknown X Social dimension	-.06	.17	-.14	-.02		
Known vs. Unknown X Importance dimension	-.04	.14	-.14	-.02		

Note. *p < 0.05.   **p < 0.01   ***p < 0.001.

02

Table 14

Summary of Hierarchical Regression Analyses: Self-Conceptions of Same Sex Relations after

Communicating over Email (N = 285).

Self-Conceptual Domains	B	SE	β	Partial r	R^2	$\triangle R^2$
Step 1					.03	.03*
Gender	.03	.18	.01	.01		
Middle adolescence	.12	.14	1.06	.05		
Late adolescence	-.12	.14	-1.08	-.05		
Home language	.54	.19	.16	.16**		
Step 2					.12	.09***
Gender	-.14	.18	-.05	-.05		
Middle adolescence	.15	.13	1.31	.07		
Late adolescence	-.16	.13	-1.35	-.07		
Home language	.44	.19	.13	.14*		
Known vs. Unknown	.53	.10	.30	.30***		
Step 3					.13	.01
Gender	-.15	.18	-.05	-.05		
Middle adolescence	.11	.14	.98	.05		
Late adolescence	-.12	.14	-1.02	-.05		
Home language	.42	.19	.13	.13*		
Known vs. Unknown	.52	.10	.30	.30***		
Social dimension	-.15	.10	-.09	-.09		
Importance dimension	.037	.08	.03	.03		
Step 4					.14	.01
Gender	-.15	.18	-.05	-.05		
Middle adolescence	.095	.14	.82	.04		
Late adolescence	-.10	.14	-.86	-.04		
Home language	.47	.19	.14	.14*		
Known vs. Unknown	.57	.25	.33	.13*		
Social dimension	-.95	.55	-.58	-.10		
Importance dimension	.72	.46	.59	.09		
Known vs. Unknown X Social dimension	.18	.12	.51	.09		
Known vs. Unknown X Importance dimension	-.15	.10	-.62	-.09		

Note. *p < 0.05. **p < 0.01 ***p < 0.001.

Table 15

Summary of Hierarchical Regression Analyses: General Self-Conceptions after Communicating over Email (N = 285).

Self-Conceptual Domains	B	SE	β	Partial r	R^2	$\triangle R^2$
Step 1					.02	.02
Gender	.011	.11	.01	.01		
Middle adolescence	.01	.08	.17	.01		
Late adolescence	-.01	.08	-.21	-.01		
Home language	.27	.11	.14	.14*		
Step 2					.06	.04***
Gender	-.05	.11	-.03	-.03		
Middle adolescence	.02	.08	.35	.02		
Late adolescence	-.03	.08	-.39	-.02		
Home language	.23	.11	.12	.12*		
Known vs. Unknown	.21	.06	.21	.21***		
Step 3					.07	.01
Gender	-.05	.11	-.03	-.03		
Middle adolescence	-.00	.08	-.01	-.01		
Late adolescence	-.00	.08	-.03	-.00		
Home language	.21	.11	.11	.11		
Known vs. Unknown	.20	.06	.20	.20**		
Social dimension	-.10	.06	-.11	-.10		
Importance dimension	-.00	.05	-.00	-.00		
Step 4					.13	.05***
Gender	-.05	.10	-.03	-.03		
Middle adolescence	-.03	.08	-.12	-.02		
Late adolescence	.02	.08	.37	.02		
Home language	.28	.11	.14	.15*		
Known vs. Unknown	.25	.15	.25	.10		
Social dimension	-1.32	.32	-1.39	-.24***		
Importance dimension	.99	.27	1.41	.22***		
Known vs. Unknown X Social dimension	.27	.07	1.34	.22***		
Known vs. Unknown X Importance dimension	-.22	.06	-1.56	-.22***		

Note. *p < 0.05.   **p < 0.01   ***p < 0.001.

Table 16

Summary of Hierarchical Regression Analyses: Self-Conceptions of Same Sex Relations

Participating in Newsgroups/Forums (N = 90).

Self-Conceptual Domains	B	SE	β	*Partial r*	R^2	$\triangle R^2$
Step 1					.01	.01
Gender	.07	.32	.02	.02		
Middle adolescence	.19	.25	1.6	.08		
Late adolescence	-.19	.25	-1.6	-.08		
Step 2					.01	.00
Gender	.59	.32	.02	.02		
Middle adolescence	.22	.25	1.87	.09		
Late adolescence	-.22	.25	-1.90	-.09		
Known vs. Unknown	.07	.12	.06	.06		
Step 3					.13	.12
Gender	.16	.31	.05	.05		
Middle adolescence	-.01	.25	-.12	-.01		
Late adolescence	.01	.25	.08	.00		
Known vs. Unknown	.03	.13	.02	.02		
Social dimension	-.27	.17	-.18	-.16		
Importance dimension	-.31	.14	-.25	-.23*		
Step 4					.19	.07
Gender	.06	.31	.02	.02		
Middle adolescence	-.19	.25	-.17	-.08		
Late adolescence	.19	.25	1.66	.08		
Known vs. Unknown	-.05	.29	-.04	-.02		
Social dimension	-.93	.39	-.62	-.25*		
Importance dimension	.17	.27	.14	.07		
Known vs. Unknown X Social dimension	.28	.13	.81	.23*		
Known vs. Unknown X Importance dimension	-.24	.11	-.64	-.23*		

Note. *p < 0.05.   **p < 0.01   ***p < 0.001.

Table 17

Summary of Hierarchical Regression Analyses: General Self-Conceptions after Participating in

Newsgroups/Forums (N = 90).

Self-Conceptual Domains	B	SE	β	Partial r	R²	△R²
Step 1					.00	.00
Gender	.03	.19	.02	.02		
Middle adolescence	.04	.14	.66	.03		
Late adolescence	-.05	.14	-.70	-.03		
Step 2					.02	.02
Gender	.04	.19	.02	.02		
Middle adolescence	.00	.15	.06	.00		
Late adolescence	-.01	.15	-.10	-.01		
Known vs. Unknown	-.09	.07	-.14	-.13		
Step 3					.15	.13**
Gender	.15	.18	.08	.09		
Middle adolescence	-.14	.14	-2.13	-.10		
Late adolescence	.14	.14	2.07	.10		
Known vs. Unknown	-.06	.07	-.08	-.08		
Social dimension	-.34	.1	-.39	-.34**		
Importance dimension	-.00	.08	-.00	-.00		
Step 4					.21	.06*
Gender	.11	.18	.06	.06		
Middle adolescence	-.25	.15	-3.69	-.18		
Late adolescence	.24	.15	3.64	.18		
Known vs. Unknown	.07	.17	.10	.04		
Social dimension	-.52	.22	-.60	-.24*		
Importance dimension	.33	.16	.46	.22*		
Known vs. Unknown X Social dimension	.09	.07	.48	.14		
Known vs. Unknown X Importance dimension	-.16	.06	-.72	-.26*		

Note. *p < 0.05. **p < 0.01 ***p < 0.001.

Table 18

Summary of Hierarchical Multiple Regression Model testing for Moderation: Self-conceptions of

Email Physical Appearance as a Moderating Factor between Offline Self-Conceptions in this

Domain and General Self-Concept (N = 184).

Self-Conceptual Domains	B	SE	β	Partial r	R^2	$\triangle R^2$
Step 1					.02	.02
Gender	.01	.11	.01	.01		
Middle adolescence	.01	.08	.17	.01		
Late adolescence	-.01	.08	-.21	-.01		
Home language	.27	.11	.14	.14**		
Step 2					.44	.42***
Gender	-.04	.08	-.02	-.03		
Middle adolescence	-.01	.06	-.20	-.01		
Late adolescence	.01	.06	.15	.01		
Home language	.04	.09	.02	.03		
Offline Self-conceptions of physical appearance	.43	.04	.56	.58***		
Online self-conceptions of physical appearance	-.39	.07	-.26	-.31***		
Step 3					.46	.01***
Gender	-.05	.08	-.03	-.03		
Middle adolescence	-.03	.06	-.39	-.03		
Late adolescence	.02	.06	.34	.02		
Home language	.05	.09	.02	.03		
Offline Self-conceptions of physical appearance	.26	.08	.33	.20***		
Online self-conceptions of physical appearance	-.91	.21	-.59	-.25***		
Offline physical appearance X Online physical appearance	.15	.06	.37	.15**		

Note. *p < 0.05.   **p < 0.01   ***p < 0.001.

Table 19

Summary of Coefficients for Moderation Analyses by Online Venue and Self-conceptual Domain

Online Venue and Self-Conceptual Domains	R^2	$\triangle R^2$	B	SE	β	*Partial r*
MORPG						
Physical appearance (N = 120)	.48	.08***	.18	.04	.87	.36***
Opposite sex relations (N = 118)	.30	.09***	.14	.04	1.51.	.33***
Same sex relations (N = 118)	.41	.03*	.10	.04	1.04	.22*
Social relations (N = 118)	.37	.06***	.14	.04	1.39	.30***
Chatroom						
Opposite sex relations (N = 68)	.36	.12***	.12	.03	1.31	.39***
Same sex relations (N = 68)	.47	.07**	.14	.04	1.46	.35**
Social relations (N = 68)	.42	.09**	.13	.04	1.36	.36**
Email						
Physical appearance (N = 284)	.46	.01**	.15	.06	.37	.15**
Newsgroup/Forum						
Opposite sex relations (N = 91)	.22	.04*	.07	.03	.76	.22*

Note. *p < 0.05. **p < 0.01 ***p < 0.001.

Table 20

Summary of Hierarchical Regressions Examining the Mediating Influence of IM Self-Conceptions of Physical Abilities on Offline Self-Conceptions of Physical Abilities and Overall General Self-Concept (N = 260).

Self-Conceptual Domains	B	SE	β	Partial r	R^2	ΔR^2
Regression 1: DV = IM Physical Abilities						
Step 1					.03	.03
Gender	-.17	.08	-.14	-.14*		
Middle adolescence	-.03	.06	-.43	-.03		
Late adolescence	.02	.06	.37	.02		
Home language	-.09	.08	-.07	-.07		
Step 2					.07	.04**
Gender	-.18	.08	-.15	-.15*		
Middle adolescence	-.04	.06	-.65	-.04		
Late adolescence	.04	.06	.59	.04		
Home language	-.07	.08	-.05	-.05		
Offline physical abilities	-.10	.03	-.19	-.19**		
Regression 2: DV = General Self-Concept						
Step 1					.02	.02
Gender	.01	.10	.01	.01		
Middle adolescence	.02	.07	.17	.01		
Late adolescence	-.02	.07	-.24	-.01		
Home language	.24	.10	.13	.13*		
Step 2					.30	.28***
Gender	.10	.08	.06	.07		
Middle adolescence	.07	.06	.67	.06		
Late adolescence	-.07	.06	-.73	-.06		
Home language	.14	.09	.07	.09		
Offline physical abilities	.44	.04	.53	.53***		
Regression 3: DV = General Self-Concept						
Step 1					.03	.03
Gender	.09	.11	.05	.05		
Middle adolescence	.04	.08	.47	.03		
Late adolescence	-.05	.08	-.54	-.04		
Home language	.23	.12	.12	.12*		
Step 2					.30	.27***
Gender	.12	.09	.07	.08		
Middle adolescence	.09	.07	1.08	.08		

table continues

Table 20 (continued)

Self-Conceptual Domains	B	SE	β	Partial r	R²	△R²
Late adolescence	-.10	.07	-1.10	-.09		
Home language	.15	.10	.08	.09		
Offline physical abilities	.41	.04	.52	.52***		
Step 3					.38	.08***
Gender	.05	.09	.03	.03		
Middle adolescence	.08	.07	.89	.07		
Late adolescence	-.08	.07	-.98	-.08		
Home language	.13	.10	.07	.08		
Offline physical abilities	.37	.04	.47	.50***		
IM physical abilities	-.42	.07	-.29	-.34***		
Regression 4: DV = General Self-Concept						
Step 1					.17	.17***
Gender	-.00	.10	-.00	-.00		
Middle adolescence	.03	.08	.30	.02		
Late adolescence	-.03	.08	-.40	-.03		
Home language	.18	.11	.10	.10		
IM physical abilities	-.55	.08	-.38	-.38***		
Step 2					.38	.21***
Gender	.05	.09	.03	.03		
Middle adolescence	.08	.07	.89	.07		
Late adolescence	-.08	.07	-.98	-.08		
Home language	.13	.10	.07	.08		
IM physical abilities	-.42	.07	-.29	-.34***		
Offline physical abilities	.370	.04	.47	.50***		

Note. *p < 0.05.   **p < 0.01 ***p < 0.001.

Table 21

Summary of Hierarchical Regressions Examining the Mediating Influence of IM Self-Conceptions of Physical Appearance on Offline Self-Conceptions of Physical Appearance and Overall General Self-Concept (N = 262).

Self-Conceptual Domains	B	SE	β	Partial r	R^2	ΔR^2
Regression 1: DV = IM Physical Appearance						
Step 1					.05	.05**
Gender	-.22	.08	-.17	-.17**		
Middle adolescence	-.04	.06	-.73	-.05		
Late adolescence	.04	.06	.67	.05		
Home language	-.12	.08	-.09	-.09		
Step 2					.08	.03**
Gender	-.21	.08	-.16	-.17**		
Middle adolescence	-.05	.06	-.77	-.05		
Late adolescence	.04	.06	.72	.05		
Home language	-.09	.08	-.07	-.07		
Offline physical appearance	-.10	.03	-.18	-.18**		
Regression 2: DV = General Self-Concept						
Step 1					.02	.02
Gender	.01	.10	.01	.01		
Middle adolescence	.02	.07	.17	.01		
Late adolescence	-.02	.07	-.24	-.02		
Home language	.24	.10	.13	.01*		
Step 2					.38	.36***
Gender	.04	.08	.02	.03		
Middle adolescence	.01	.06	.05	.01		
Late adolescence	-.01	.06	-.12	-.01		
Home language	.08	.08	.04	.05		
Offline physical appearance	.47	.03	.61	.61***		
Regression 3: DV = General Self-Concept						
Step 1					.03	.03
Gender	.09	.11	.05	.05		
Middle adolescence	.04	.08	.45	.03		
Late adolescence	-.05	.08	-.52	-.03		
Home language	.23	.12	.12	.12		
Step 2					.37	.34***
Gender	.03	.09	.02	.02		

Table 21 (continued).

Self-Conceptual Domains	B	SE	β	Partial r	R²	△R²
Middle adolescence	.05	.07	.59	.05		
Late adolescence	-.06	.07	-.67	-.05		
Home language	.07	.10	.04	.05		
Offline physical appearance	.046	.04	.59	.59***		
Step 3					.44	.07***
Gender	-.05	.09	-.03	-.04		
Middle adolescence	.03	.06	.38	.03		
Late adolescence	-.04	.06	-.47	-.04		
Home language	.04	.09	.02	.03		
Offline physical appearance	.42	.04	.54	.58***		
IM physical appearance	-.39	.07	-.28	-.33***		

Regression 4: DV = General Self-Concept

	B	SE	β	Partial r	R²	△R²
Step 1					.16	.16***
Gender	-.03	.10	-.02	-.02		
Middle adolescence	.02	.08	.18	.01		
Late adolescence	-.02	.08	-.27	-.02		
Home language	.17	.11	.09	.09		
IM physical appearance	-.53	.08	-.37	-.37***		
Step 2					.44	.28***
Gender	-.05	.09	-.03	-.04		
Middle adolescence	.03	.06	.38	.03		
Late adolescence	-.04	.06	-.47	-.04		
Home language	.04	.09	.02	.03		
IM physical appearance	-.39	.07	-.28	-.33***		
Offline physical appearance	.42	.04	.54	.58***		

Note. *$p < 0.05$.   **$p < 0.01$ ***$p < 0.001$.

Table 22

Summary of Hierarchical Regressions Examining the Mediating Influence of Email Self-Conceptions of Physical Abilities on Offline Self-Conceptions of Physical Abilities and Overall General Self-Concept (N = 284).

Self-Conceptual Domains	B	SE	β	Partial r	R^2	$\triangle R^2$
Regression 1: DV = IM Physical Abilities						
Step 1					.06	.06***
Gender	-.21	.07	-.18	-.18**		
Middle adolescence	-.02	.05	-.33	-.03		
Late adolescence	.02	.05	.29	.02		
Home language	-.19	.07	-.15	-.15**		
Step 2					.13	.07***
Gender	-.22	.07	-.19	-.20***		
Middle adolescence	-.03	.05	-.48	-.04		
Late adolescence	.03	.05	.44	.04		
Home language	-.16	.07	-.13	-.14*		
Offline physical abilities	-.13	.03	-.26	-.26***		
Regression 2: DV = General Self-Concept						
Step 1					.02	.02
Gender	.01	.10	.01	.02		
Middle adolescence	.02	.07	.17	.01		
Late adolescence	-.02	.07	-.24	-.02		
Home language	.24	.10	.13	.13*		
Step 2					.30	.28***
Gender	.10	.08	.06	.07		
Middle adolescence	.07	.06	.67	.06		
Late adolescence	-.07	.06	-.73	-.06		
Home language	.14	.09	.07	.09		
Offline physical abilities	.44	.04	.53	.53***		
Regression 3: DV = General Self-Concept						
Step 1					.02	.02
Gender	.01	.11	.01	.01		
Middle adolescence	.05	.08	.47	.04		
Late adolescence	-.06	.08	-.53	-.04		
Home language	.22	.12	.11	.11		
Step 2					.29	.27***
Gender	.06	.09	.04	.04		
Middle adolescence	.09	.07	.77	.07		

table continues

Table 22 (continued).

Self-Conceptual Domains	B	SE	β	Partial r	R²	△R²
Late adolescence	-.09	.07	-.83	-.08		
Home language	.13	.10	.07	.12		
Offline physical abilities	.43	.04	.52	.53		
Step 3					.37	.08***
Gender	-.04	.09	-.02	-.03		
Middle adolescence	.07	.07	.63	.06		
Late adolescence	-.08	.07	-.70	-.07		
Home language	.06	.10	.03	.04		
Offline physical abilities	.37	.04	.45	.48***		
IM physical abilities	-.46	.08	-.30	-.33***		
Regression 4: DV = General Self-Concept						
Step 1					.18	.18***
Gender	-.12	.10	-.07	-.07		
Middle adolescence	.04	.08	.33	.03		
Late adolescence	-.05	.08	-.41	-.04		
Home language	.09	.11	.05	.05		
IM physical abilities	-.65	.09	-.42	-.41***		
Step 2					.37	.19***
Gender	-.04	.09	-.02	-.03		
Middle adolescence	.07	.07	.63	.06		
Late adolescence	-.08	.07	-.70	-.07		
Home language	.06	.10	.03	.04		
IM physical abilities	-.46	.08	-.30	-.33***		
Offline physical abilities	.37	.04	.45	.48***		

Note. *p < 0.05.   **p < 0.01 ***p < 0.001.

Table 23

Summary of Hierarchical Regressions Examining the Mediating Influence of Email Self-Conceptions of

Physical Appearance on Offline Self-Conceptions of Physical Appearance and Overall General Self-Concept

(N = 286).

Self-Conceptual Domains	B	SE	β	Partial r	R^2	ΔR^2
Regression 1: DV = IM Physical Appearance						
Step 1					.05	.05**
Gender	-.19	.07	-.16	-.16**		
Middle adolescence	-.02	.05	-.28	-.02		
Late adolescence	.02	.05	.25	.02		
Home language	-.17	.07	-.14	-.14*		
Step 2					.10	.04***
Gender	-.19	.07	-.16	-.16*		
Middle adolescence	-.01	.05	-.16	-.01		
Late adolescence	.01	.05	.12	.01		
Home language	-.14	.07	-.12	-.12*		
Offline physical appearance	-.11	.03	-.21	-.22		
Regression 2: DV = General Self-Concept						
Step 1					.02	.02
Gender	.01	.10	.01	.01		
Middle adolescence	.02	.07	.17	.01		
Late adolescence	-.02	.07	-.24	-.02		
Home language	.24	.10	.13	.13*		
Step 2					.38	.36***
Gender	.04	.08	.02	.03		
Middle adolescence	.01	.06	.05	.01		
Late adolescence	-.01	.06	-.12	-.01		
Home language	.08	.08	.04	.05		
Offline physical appearance	.47	.03	.61	.61***		
Regression 3: DV = General Self-Concept						
Step 1					.02	.02
Gender	.02	.11	.01	.01		
Middle adolescence	.05	.08	.44	.04		
Late adolescence	-.06	.08	-.50	-.04		
Home language	.20	.12	.11	.10		
Step 2					.40	.38***
Gender	.02	.09	.01	.01		

table continues

Table 23 (continued).

Self-Conceptual Domains	B	SE	β	Partial r	R²	△R²
Middle adolescence	.01	.07	.07	.01		
Late adolescence	-.01	.07	-.13	-.01		
Home language	.06	.09	.03	.04		
Offline physical appearance	.49	.04	.62	.62***		
Step 3					.46	.06***
Gender	-.06	.08	-.03	-.04		
Middle adolescence	.00	.06	.03	.00		
Late adolescence	-.01	.06	-.10	-.01		
Home language	-.00	.09	-.00	-.00		
Offline physical appearance	.45	.04	.56	.63***		
IM physical appearance	-.42	.07	-.27	-.33***		

Regression 4: DV = General Self-Concept

	B	SE	β	Partial r	R²	△R²
Step 1					.16	.16***
Gender	-.10	.10	-.05	-.06		
Middle adolescence	.04	.08	.33	.03		
Late adolescence	-.05	.08	-.40	-.04		
Home language	.10	.11	.05	.05		
IM physical appearance	-.62	.09	-.39	-.38***		
Step 2					.46	.30***
Gender	-.06	.08	-.03	-.04		
Middle adolescence	.00	.06	.03	.00		
Late adolescence	-.01	.06	-.10	-.01		
Home language	-.00	.09	-.00	-.00		
IM physical appearance	-.42	.07	-.27	-.39***		
Offline physical appearance	.45	.04	.56	.60***		

Note. $*p < 0.05.$ $**p < 0.01$ $***p < 0.001.$

Table 24

Summary of Hierarchical Regressions Examining the Mediating Influence of Newsgroup Self-Conceptions of Physical Abilities on Offline Self-Conceptions of Physical Abilities and Overall General Self-Concept (N = 94).

Self-Conceptual Domains	B	SE	β	Partial r	R^2	$\triangle R^2$
Regression 1: DV = Newsgroup Physical Abilities						
Step 1					.07	.07
Gender	-.25	.19	-.13	-.13		
Middle adolescence	-.27	.12	-3.14*	-.22		
Late adolescence	.27	.12	3.08*	.22		
Step 2					.12	.05*
Gender	-.34	.19	-.18	-.18		
Middle adolescence	-.26	.12	-2.98*	-.22		
Late adolescence	.25	.12	2.92*	.21		
Offline physical abilities	-.17	.08	-.22*	-.22		
Regression 2: DV = General Self-Concept						
Step 1					.01	.01
Gender	.03	.10	.02	.02		
Middle adolescence	.04	.07	.43	.03		
Late adolescence	-.05	.07	-.51	-.04		
Step 2					.30	.29***
Gender	.11	.08	.06	.07		
Middle adolescence	.08	.06	.82	.07		
Late adolescence	-.08	.06	-.89	-.08		
Offline physical abilities	.45	.04	.54***	.54		
Regression 3: DV = General Self-Concept						
Step 1					.02	.02
Gender	-.04	.24	-.02	-.02		
Middle adolescence	.20	.15	1.88	.13		
Late adolescence	-.20	.15	-1.92	-.13		
Step 2					.27	.25***
Gender	.20	.21	.09	.10		
Middle adolescence	.16	.13	1.51	.12		
Late adolescence	-.16	.13	-1.55	-.13		

table continues

Table 24 (continued).

Self-Conceptual Domains	B	SE	β	Partial r	R^2	$\triangle R^2$
Offline physical abilities	.47	.08	.51***	.51		
Step 3					.36	.09***
Gender	.08	.21	.03	.04		
Middle adolescence	.06	.13	.59	.05		
Late adolescence	-.07	.13	-.65	-.06		
Offline physical appearance	.41	.08	.44***	.47		
Newsgroup physical abilities	-.39	.11	-.31***	-.34		
Regression 4: DV = General Self-Concept						
Step 1					.18	.18***
Gender	-.17	.22	-.07	-.08		
Middle adolescence	.06	.15	.59	.05		
Late adolescence	-.07	.14	-.66	-.05		
Newsgroup physical abilities	-.50	.12	-.41	-.40		
Step 2					.36	.18***
Gender	.08	.21	.03	.04		
Middle adolescence	.06	.13	.59	.05		
Late adolescence	-.07	.13	-.65	-.06		
Newsgroup physical abilities	-.38	.11	-.31***	-.34		
Offline physical abilities	.41	.08	.44***	.47		

Note. *p < 0.05.   **p < 0.01 ***p < 0.001.

98

Figure 1. Interaction effects for self-conceptions of chatroom opposite sex relations: Category X Social Dimension
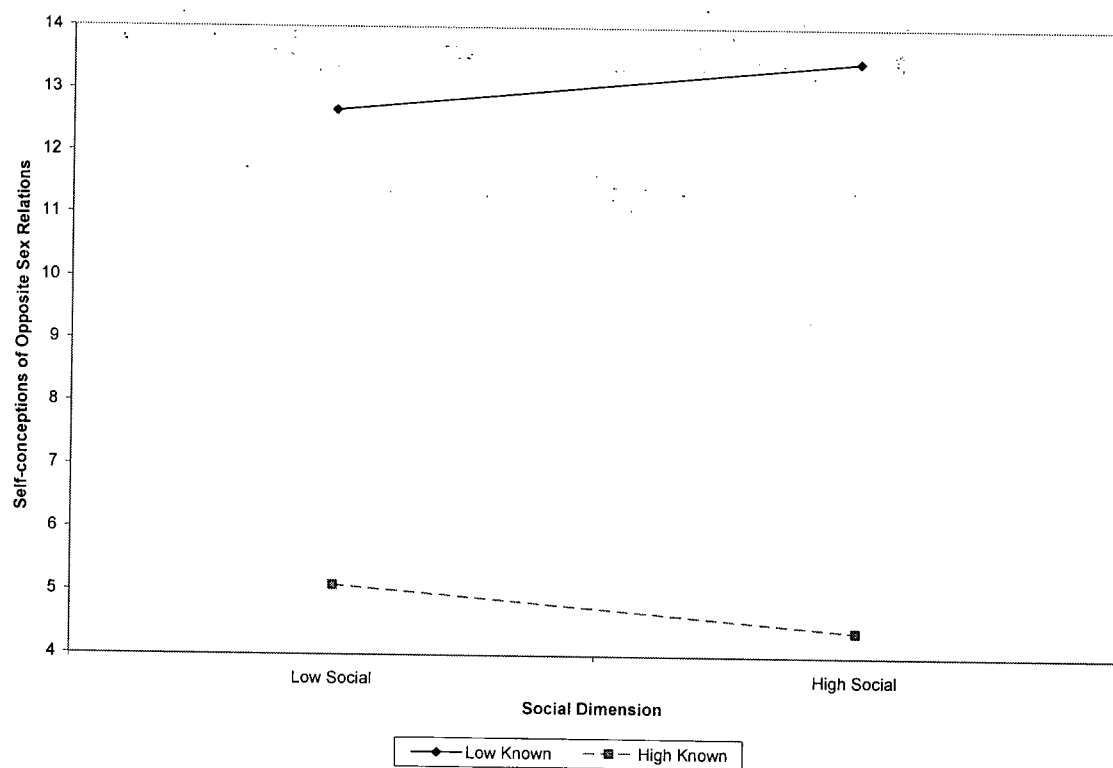
Figure 2. Interaction effects for self-conceptions of chatroom opposite sex relations: Category X Importance Dimensions.
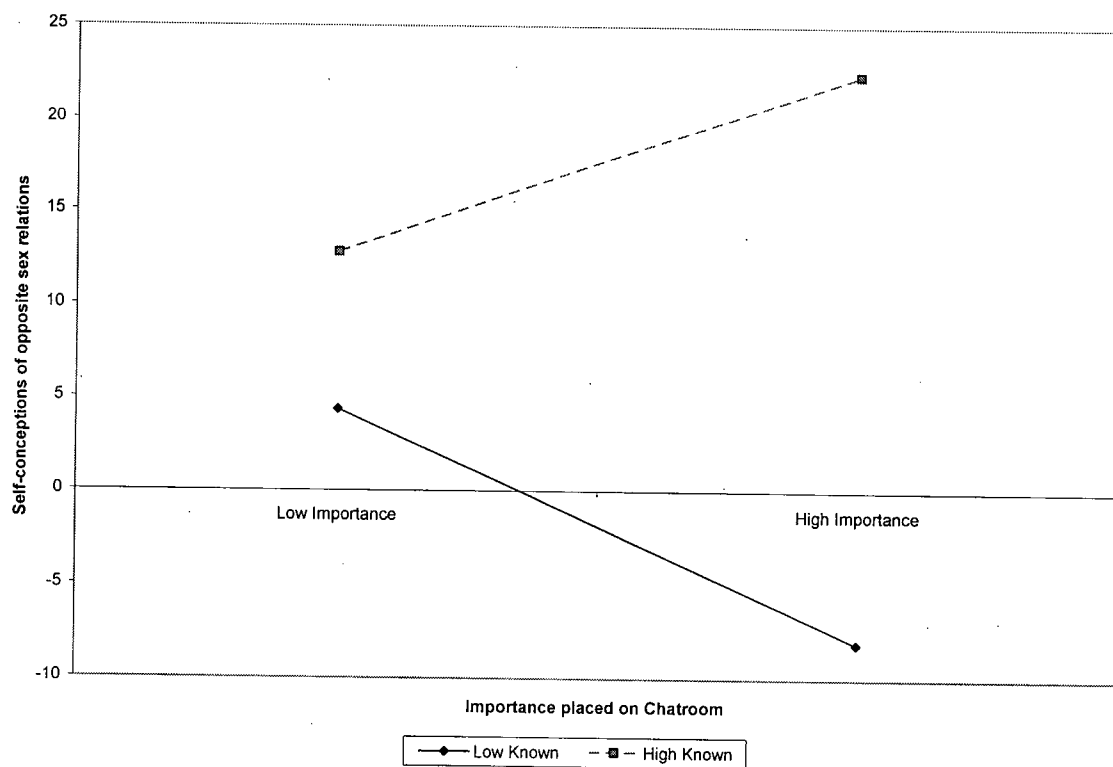
Figure 3: Interaction effects for general self-conceptions over Email: Category X Social Dimension.
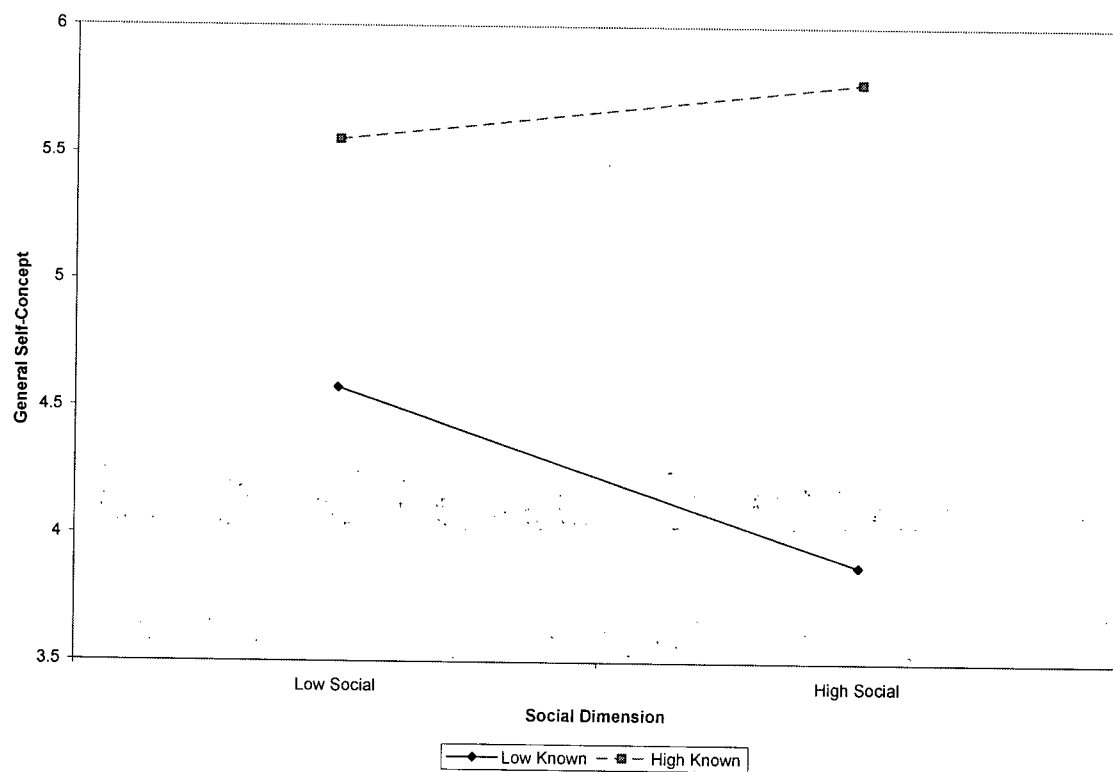
Figure 4. Interaction effects for general self-conceptions over Email: Category X

Importance Dimension.
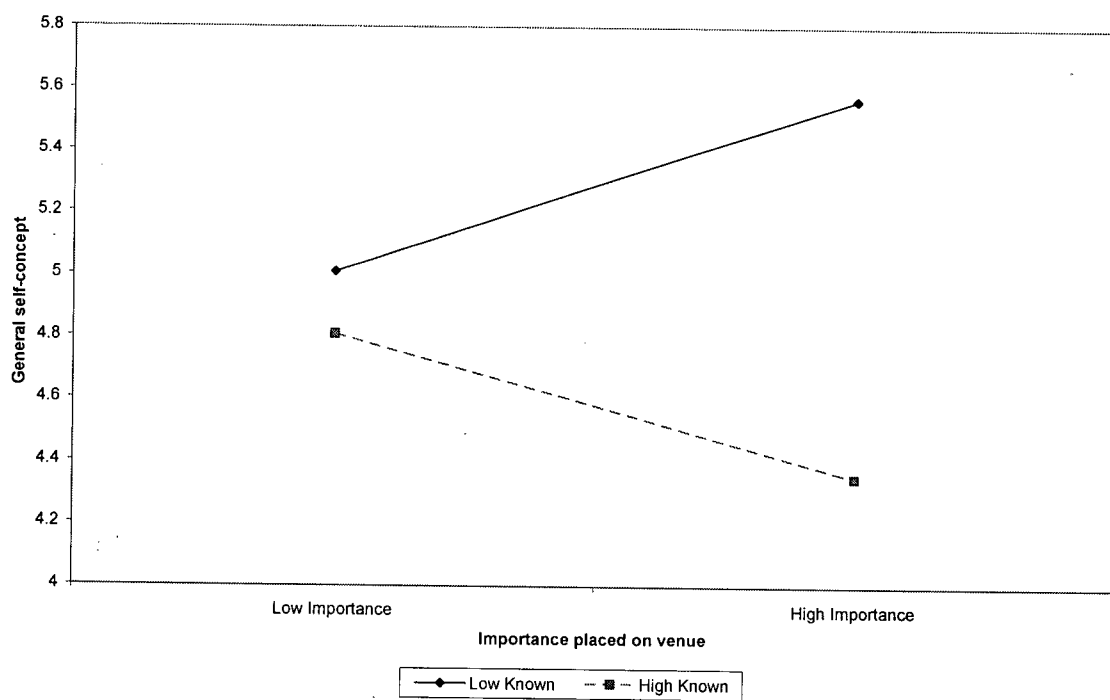
Figure 5: Interaction effects for self-conceptions of Newsgroup/Forum same sex

relations: Category X Social Dimension.
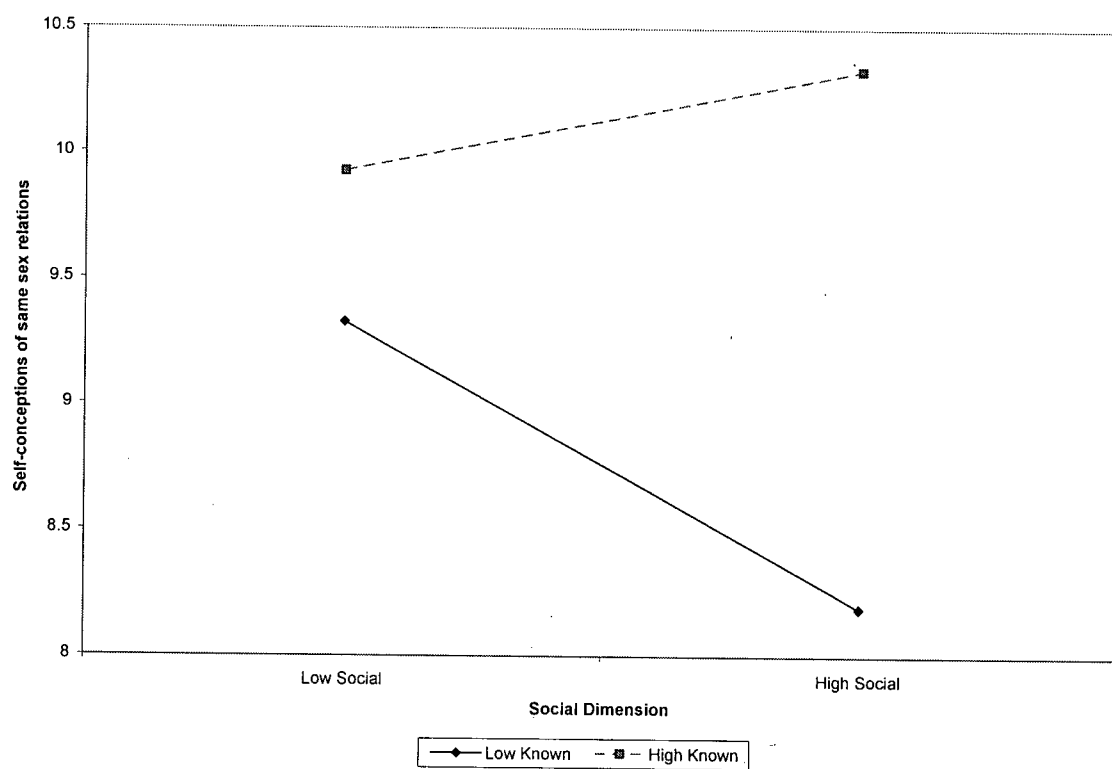
Figure 6. Interaction effects for self-conceptions of Newsgroup/Forum same sex

relations: Category X Importance Dimension.
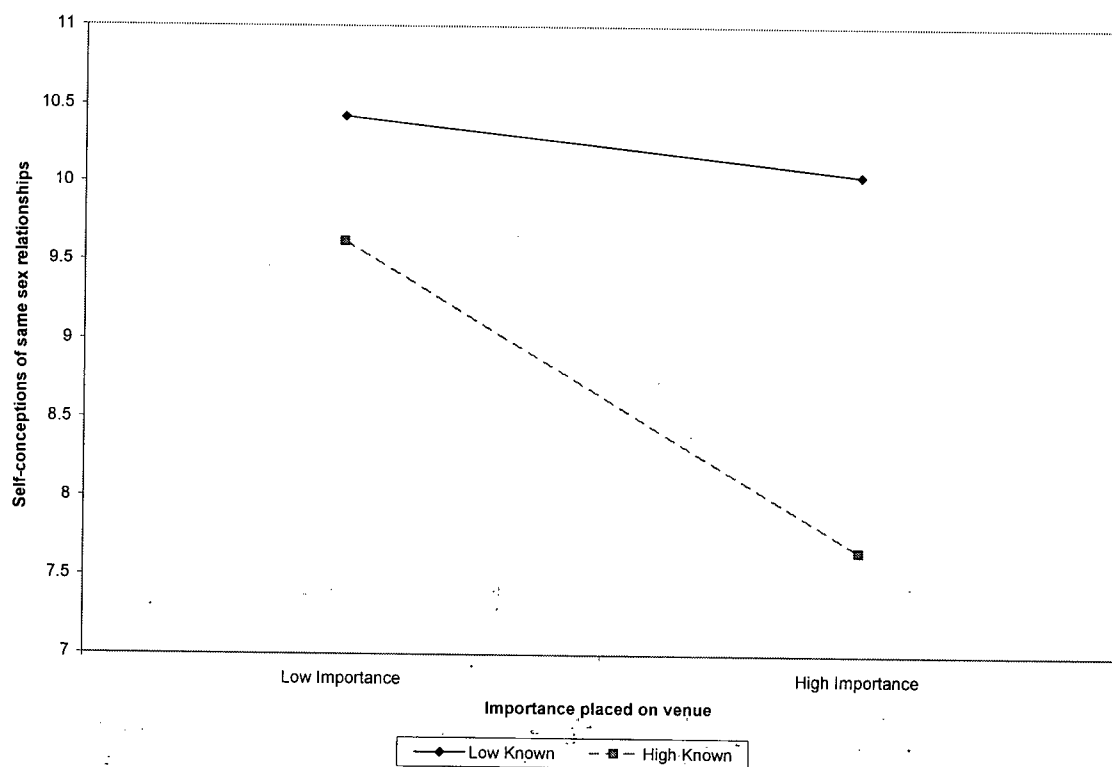
Figure 7: Interaction effects of general self-conceptions in Newsgroups/Forums:

Category X Importance Dimension.
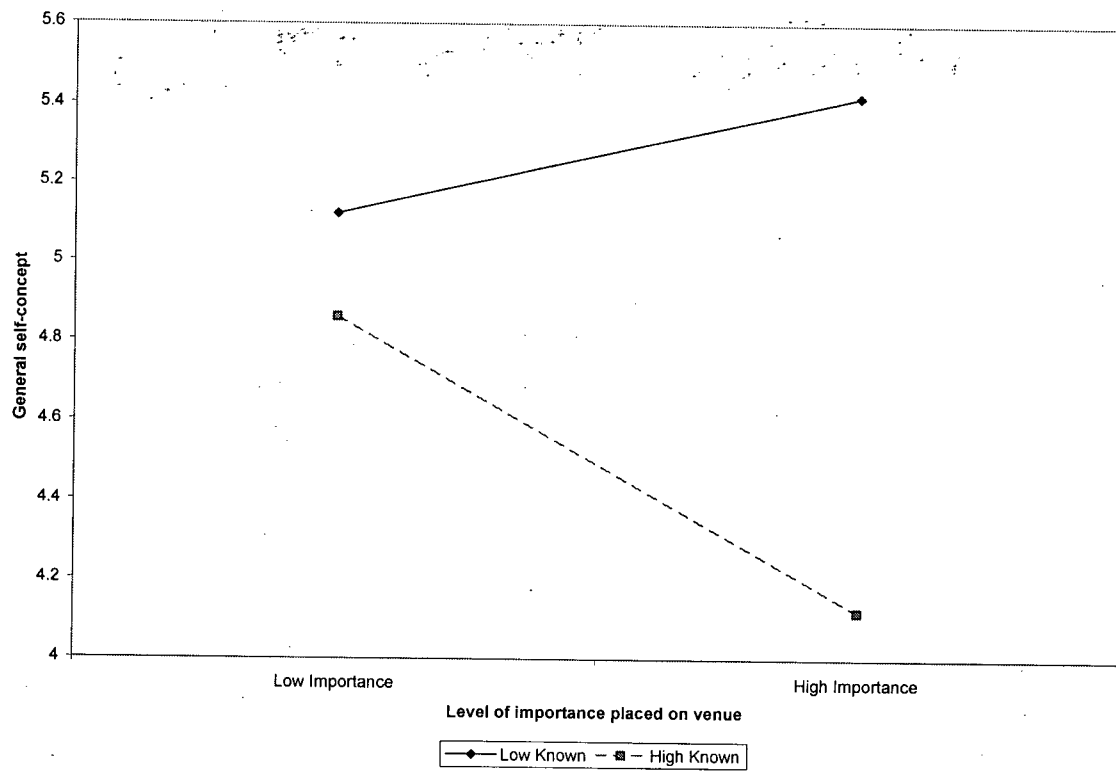
Figure 8. Self-conceptions of MORPGs physical appearance as moderator between offline self-conceptions in this domain and general-self-concept.
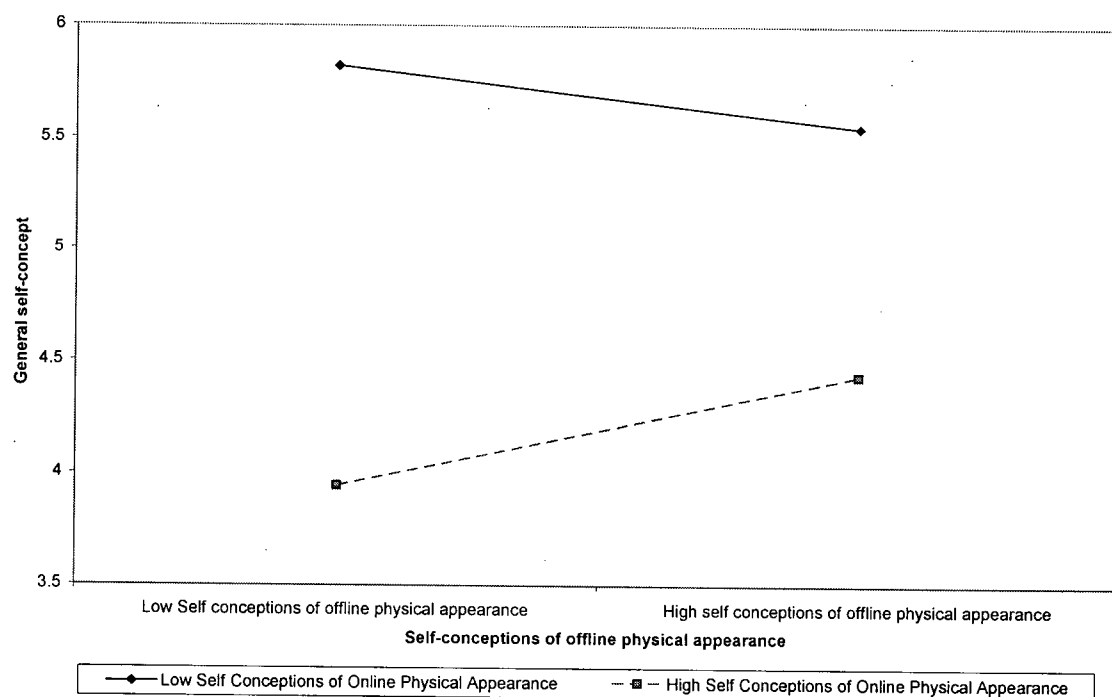
Figure 9. Self-conceptions of MORPGs opposite sex relations as moderator between offline self-conceptions in this domain and general-self-concept.
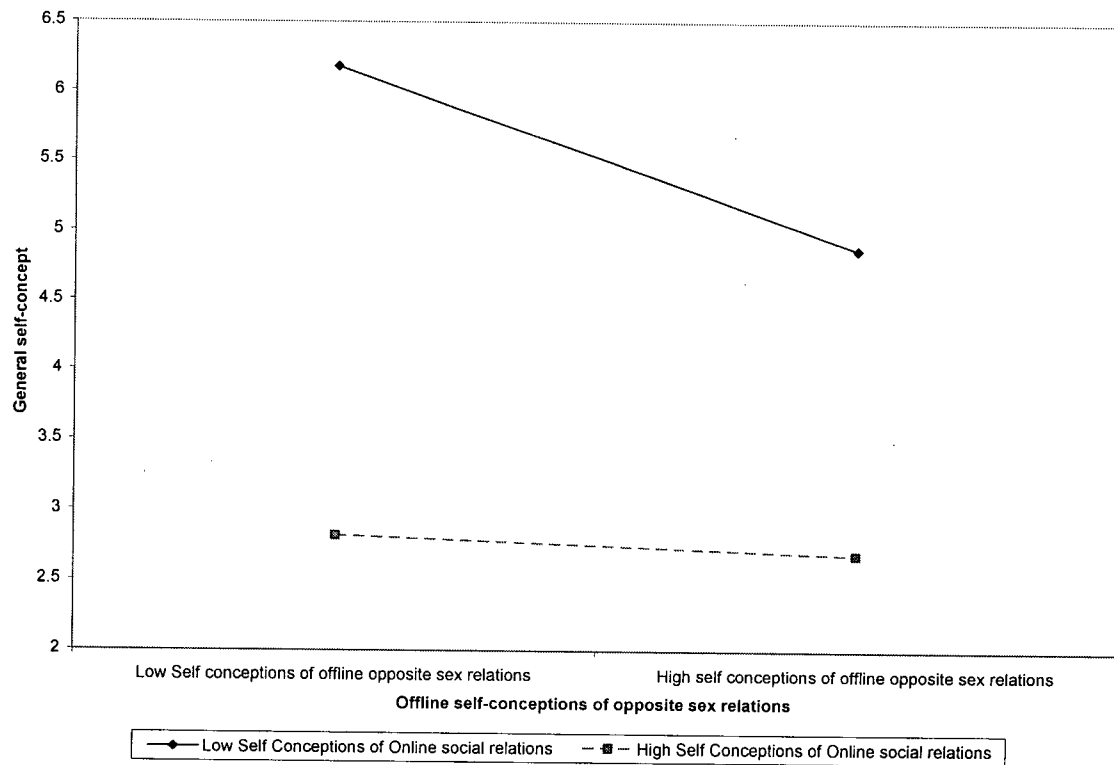
Figure 10. Self-conceptions of chatroom social relations as moderator between offline self-conceptions in this domain and general-self-concept.
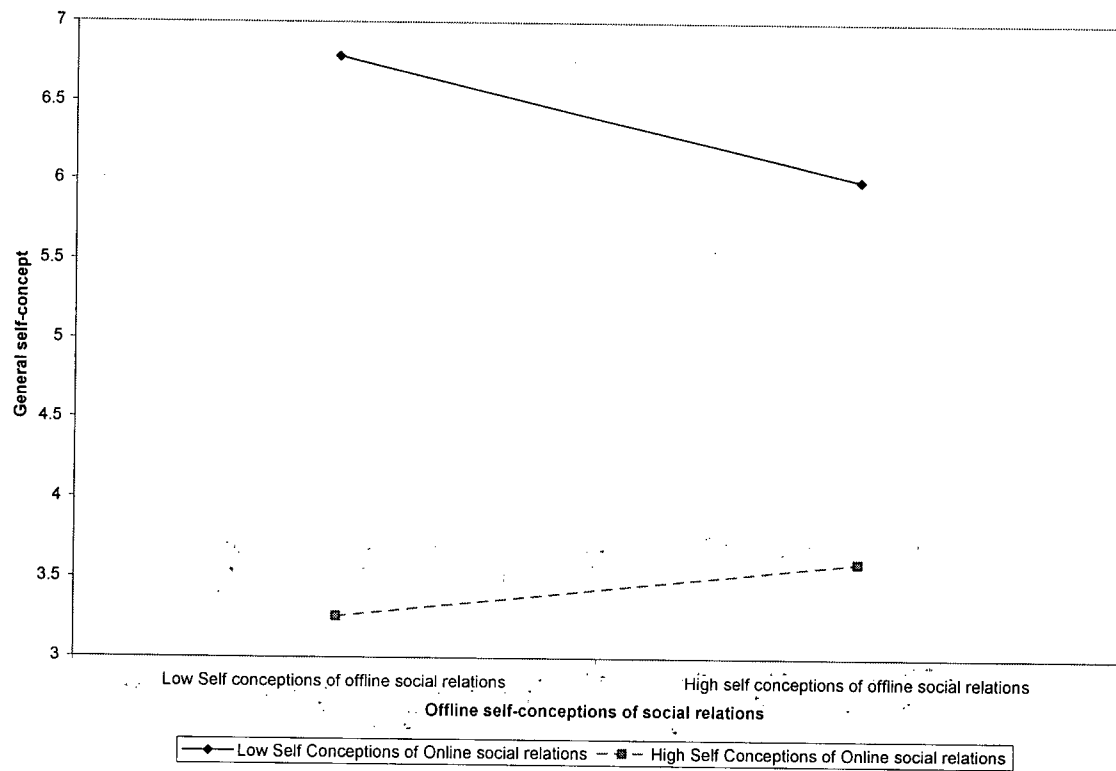
Figure 11. Self-conceptions of Email physical appearance as moderator between offline

self-conceptions in this domain and general-self-concept.
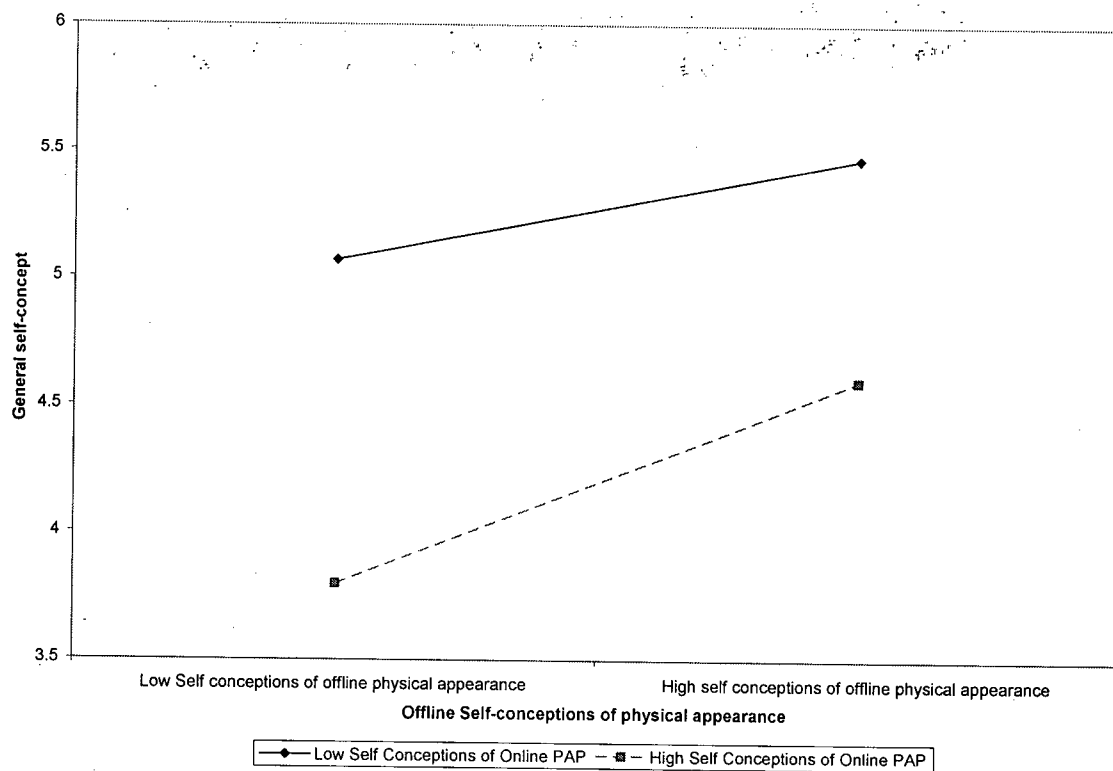
Figure 12. Self-conceptions of Newsgroup/Forum opposite sex relations as moderator between offline self-conceptions in this domain and general-self-concept.
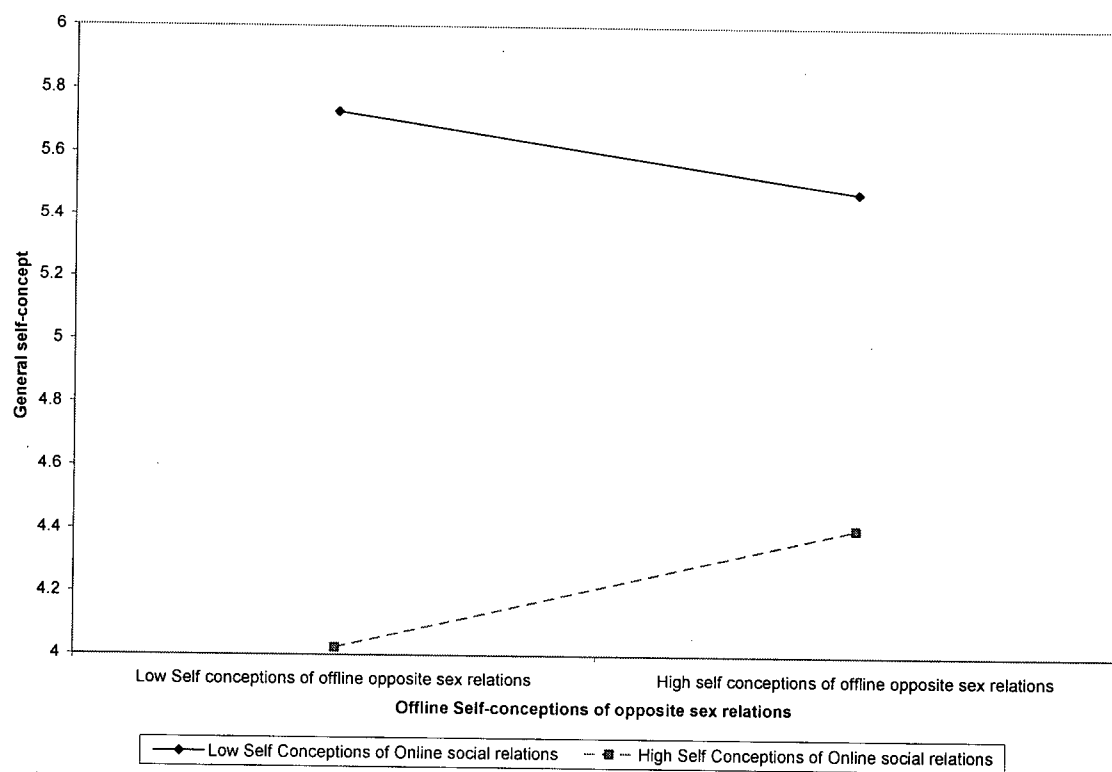
Appendix A

Demographic Information

SECTION 1: TELL US ABOUT YOURSELF

We are interested in learning about your background. Please follow the directions carefully, and answer ALL of the questions. REMEMBER, YOUR ANSWERS WILL REMAIN PRIVATE AND WILL BE SEEN ONLY BY THE RESEARCHERS.

1. Are you male or female? (CHECK ONE)
   □ Male □ Female

2. What is your date of birth?
   _____ / _____ / _____
   MONTH   DAY   YEAR

3. What grade are you in? _____

4. What is your cultural background (check all that apply): We are asking this question to get an idea of the cultural backgrounds of the students answering this questionnaire.
   □ First Nations / Native
   □ Caucasian / European
   □ Latino / Hispanic
   □ African
   □ Middle Eastern (e.g. Israel, Saudi Arabia, Iran)
   □ South Asian (e.g. India, Pakistan, Sri Lanka)
   □ East Asian (e.g. China, Japan, Korea)
   □ South East Asian (e.g. Philippines, Indonesia, Thailand)

5. Were you born in Canada?   Yes □   No □
   If "No", what year did you move to Canada? _____

6. What Language do you normally speak at home?
   English ____ Other ____

   If you speak a language other than English at home, what is it?
   _____

Appendix A (cont'd)

7. What is the living situation of the people you think of as your parents. We are asking this question to get an idea of the types of families students your age come from.

    ☐ Married / common law (living together in the same household).
    ☐ Separated / divorced, and I live mostly with my father.
    ☐ Separated / divorced, and I live mostly with my mother.
    ☐ Separated / divorced, and I spend about the same amount of time with each parent.
    ☐ Single parenting situation (e.g. never married, widowed).
    ☐ I don't live with my parents.

7a. If your parents are separated, divorced, or a single parent, what year did that happen in (If it has been for your whole life, just write "my whole life" instead of the year)?

_____

8. Do you have any brothers and sisters?
I have _____ brothers. I have _____ sisters.

9. What is the highest level of education that you expect to get? (check one)
☐ High school diploma
☐ College diploma, technical certification, or other non-university training.

☐ Bachelor's degree (e.g. B.A., B.Ed.)
☐ Graduate or professional degree (e.g. PhD or M.D.).
☐ I don't know

Appendix A (cont'd)

Online Self-Concept Questionnaire

SECTION 2A: TELL US ABOUT YOUR ONLINE ACTIVITIES

We would like to learn more about the kinds of things you do online. Please circle the answer that best fits you. REMEMBER, YOUR ANSWERS WILL REMAIN PRIVATE AND WILL NOT BE SEEN BY YOUR PARENTS OR TEACHERS.

1. Do you play Multi- player Online Role Playing Games (also known as MORPGs), such as Diablo/Diablo II, Dungeons and Dragons, Never Winter Nights, etc.? ☐ Yes ☐ No
2. Do you go to Chatrooms? ☐ Yes ☐ No
3. Do you use Instant Messaging (e.g. MSN, ICQ, etc.) ☐ Yes ☐ No
4. Do you use Email? ☐ Yes ☐ No
5. Are you part of a Newsgroup or Forum where you can post or read other people's opinions on a certain topic? ☐ Yes ☐ No
6. Which of the following online activities do you do the most (CIRCLE ONLY ONE)?

     a) MORPGs
     b) Chatrooms
     c) Instant Messaging
     d) Email
     e) Newsgroups/Forums

7. Please rank the following online activities from most favorite to least favorite, with 1 being your favorite and 5 being your least favorite. Ignore any that you don't use.

     a) MORPGs _____
     b) Chatrooms _____
     c) Instant Messaging _____
     d) Email _____
     e) Newsgroups/Forums _____

8. For the online activity that you marked as number 1 (your favorite), please explain why this is your favorite online activity.

_____
_____
_____
_____
_____
_____
_____

Appendix A (cont'd)

SECTION 2B: MORPGs

If you play MORPGs regularly please answer the following questions. If not, please skip to Section 2C, on page 9.

9. *On average*, how many days a week do you play MORPGs?
    a) One day each week or less
    b) Between 2 and 5 days a week
    c) Every day of the week

10. *On average* how many hours each week do you play MORPGs?
    a) 1 hour or less
    b) between 2 and 5 hours a week
    c) between 8 and 10 hours a week
    d) 10 or more hours a week

11. *On average*, when you play MORPGs, how much time do you spend playing in one session?
    a) 1 hour or less
    b) 2 to 4 hours
    c) 5 to 8 hours
    d) 9 or more hours

On a scale of 1 to 5, how much do you agree with the following statements?

12. I spend most of my time playing one MORPG in particular.

1	2	3	4	5
Disagree				Agree

13. I switch from one MORPG to another depending on which one my friends are playing.

1	2	3	4	5
Disagree				Agree

14. I mostly play MORPGs with people that I also know in real life.

1	2	3	4	5
Disagree				Agree

Appendix A (cont'd)

15. I mostly play MORPGs with people that I've only met online.

1	2	3	4	5
Disagree				Agree

16. I play MORPGs to talk to people.

1	2	3	4	5
Disagree				Agree

17. I play MORPGs to win the game.

1	2	3	4	5
Disagree				Agree

18. I play MORPGs to try out being different characters.

1	2	3	4	5
Disagree				Agree

19. Do you take on a personality that is different from your real personality when you play an MORPG?

1	2	3	4	5
Not at all a different person				A totally different person

20. Is the appearance of your MORPG character different from what you really look like?

1	2	3	4	5
Don't really change my physical appearance online				My physical appearance is totally different online

Appendix A (cont'd)

21. I change my physical appearance online to help me meet the goals of the MORPG?

1   2   3   4   5

Not at all true   Very True

22. I change my physical appearance in MORPGs so that other players will view me differently from how I am in real life.

1   2   3   4   5

Not at all true   Very true

23. Do you prefer your online MORPG physical appearance over your real physical appearance?

1   2   3   4   5   ☐

Do not prefer online physical appearance   Prefer online physical appearance   Does not apply to me

24. The reason I play MORPGs is to try playing a character that looks different from what I really look like.

1   2   3   4   5

Not at all true   Very true

25. The reason I play MORPGs is to change the physical abilities of my MORPG character.

1   2   3   4   5

Not at all true   Very true

26. Is your MORPG character's physical abilities different from your real physical abilities?

1   2   3   4   5

My physical abilities in the MORPG are about the same as my offline abilities.   My MORPG physical abilities are totally different from my offline abilities

Appendix A (cont'd)

27. I change my physical abilities online to help me meet the goals of the MORPG?

1	2	3	4	5
Not at all true				Very True

28. I change my physical abilities of my MORPG character so that other players will view me differently from how I am in real life.

1	2	3	4	5
Not at all true				Very true

29. Do you prefer your MORPG physical abilities to your real physical abilities?

1	2	3	4	5	□
Do not prefer online physical abilities				Prefer online physical abilities	Does not apply to me

30. The reason I play MORPGs to make close friendships

1	2	3	4	5
Not at all true				Very true

31. The reason I play MORPGs to feel accepted by others.

1	2	3	4	5
Not at all true				Very true

32. How important is playing MORPGs to you?

1	2	3	4	5
Not at all important				Very important

Appendix A (cont'd)

33. How many of the people that you only know online _and_ play MORPGs with do you consider to be your close friends?

1	2	3	4	5
None		Some		Most

34. How upset would you be if you had to stop playing MORPGs?

1	2	3	4	5
Not upset at all				Very upset

35. How strong are the friendships you have with the people you play MORPGs with?

1	2	3	4	5
Not at all Strong		Somewhat strong		Very Strong

36. How much has playing MORPGs strengthened your friendships with people you only know online?

1	2	3	4	5
Not at all		Some		A lot

37. How much has playing MORPGs strengthened your friendships with people you know in real life?

1	2	3	4	5
Not at all		Some		A lot

38. Compared to real life, how much do you feel able to be yourself in MORPGs?

1	2	3	4	5
Not at all		Somewhat		Very well

39. Do you prefer the person you are in your MORPG better than the person you are in real life?

1	2	3	4	5	□
Prefer offline self		Don't care		Prefer online self	I am the same person online and offline

SECTION 2C: CHATROOMS

If you chat in Chatrooms regularly please answer the following questions. If not, please skip to Section 2D, on page 14.

40. *On average*, how many days a week do you use Chatrooms?
   a) Once a week or less
   b) Between 2 and 5 days a week
   c) Every day of the week

41. *On average* how many hours a week do you use Chatrooms?
   a) 1 hour or less
   b) Between 2 and 5 hours a week
   c) Between 8 and 10 hours a week
   d) 10 or more hours a week

42. *On average*, when you chat in Chatrooms, how much time do you spend chatting in one session?
   a) 1 hour or less
   b) 2 to 4 hours
   c) 5 to 8 hours
   d) 9 or more hours

On a scale of 1 to 5, how much do you agree with the following statements?

43. I spend most of my time chatting in one Chatroom in particular.

1	2	3	4	5
Disagree				Agree

Appendix A (cont'd)

44. I move from Chatroom to Chatroom depending on which one my friends are going to.

1	2	3	4	5
Disagree				Agree

45. I mostly chat in Chatrooms with people that I also know in real life.

1	2	3	4	5
Disagree				Agree

46. I mostly chat in Chatrooms with people that I only know online.

1	2	3	4	5
Disagree				Agree

47. I chat in Chatrooms to get to know other people and make friends.

1	2	3	4	5
Disagree				Agree

48. I chat in Chatrooms to chat about the topics being discussed in the Chatrooms.

1	2	3	4	5
Disagree				Agree

49. I chat in Chatrooms to try out being a different person than I am in real life (i.e., pretend to be a person or a type of person that I am not in real life).

1	2	3	4	5
Disagree				Agree

50. Do you take on a different personality when you chat in Chatrooms?

1	2	3	4	5
Not at all a different person				A totally different person in the Chatroom

Appendix A (cont'd)

51. Do you change your physical appearance when you Chatrooms (i.e. tell people you look different from what you look like in real life)?

1	2	3	4	5
Don't really change my physical appearance in Chatrooms				My physical appearance in Chatrooms is totally different

52. I change my physical appearance in Chatrooms so that other people will view me differently from how I am seen in real life.

1	2	3	4	5
Not at all true				Very true

53. Do you prefer your Chatroom physical appearance over your real physical appearance?

1	2	3	4	5	☐
Do not prefer online physical appearance		Don't care		Prefer online physical appearance	Does not apply to me

54. The main reason I chat in Chatrooms is to change my physical appearance (i.e. let people think I look different from what I look like offline).

1	2	3	4	5
Not at all true				Very true

55. I chat in Chatrooms to see what it would be like to be someone who has different *physical abilities* from what I have in real life (i.e. let people think that I can do things that I normally can't do in real life).

1	2	3	4	5
Not at all true				Very true

56. Do you change your physical abilities when you use Chatrooms (i.e. tell people you can do things that you really can't do)?

1	2	3	4	5
Don't really change my physical abilities				My physical abilities in Chatrooms are totally different

57. I change my physical abilities in Chatrooms so that other people will view me differently from how I am seen in real life.

1	2	3	4	5
Not at all true				Very true

58. Do you prefer your Chatroom physical abilities to your physical abilities in real life?

1	2	3	4	5	□
Do not prefer online physical abilities		Don't care		Prefer online physical abilities	Does not apply to me

59. The reason I chat in Chatrooms is to make close friendships

1	2	3	4	5
Not at all true				Very true

60. The reason I chat in Chatrooms is to feel accepted by others.

1	2	3	4	5
Not at all true				Very true

61. How important is chatting in Chatrooms to you?

1	2	3	4	5
Not that important				Very important

Appendix A (cont'd)

62. How many of the people that you only know online and chat with in Chatrooms would you consider to be your close friends?

1	2	3	4	5
None		Some		Most

63. How upset would you be if you had to stop chatting in Chatrooms?

1	2	3	4	5
Not upset at all				Very upset

64. How strong are the friendships you have with the people you chat with in Chatrooms?

1	2	3	4	5
Not at all Strong		Somewhat strong		Very Strong

65. How much has chatting in Chatrooms strengthened your friendships with people you only know online?

1	2	3	4	5
Not at all		Some		A lot

66. How much has chatting in Chatrooms strengthened your friendships with people you know in real life?

1	2	3	4	5
Not at all		Some		A lot

67. Compared to offline, do you feel more able to be yourself in Chatrooms?

1	2	3	4	5
Not at all well		Somewhat		Very well

Appendix A (cont'd)

68. Do you prefer the person you are in Chatrooms to the person you are real life?

1	2	3	4	5	□
Prefer offline self		Don't care		Prefer online self	I am the same person online and offline

SECTION D: INSTANT MESSAGING

If you use Instant Messaging (IM) regularly please answer the following questions. If not, please skip to Section 2E on page 18.

69. *On average,* how many days a week do you use IM? (Note: this is asking how much time you actually spend chatting on IM and not whether you have IM running in the background)
> a) One day a week or less
> b) Between 2 and 5 days a week
> c) Every day of the week

70. *On average* how many hours a week do you use IM? (Note: this is asking how much time you actually spend chatting on IM and not whether you have IM running in the background)
> a) 1 hour or less
> b) Between 2 and 5 hours a week
> c) Between 8 and 10 hours a week
> d) 10 or more hours a week

71. *On average,* when you use IM, how much time do you spend chatting with others? (Note: this is asking how much time you actually spend chatting on IM and not whether you have IM running in the background)
> a) 1 hour or less
> b) 2 to 4 hours
> c) 5 to 8 hours
> d) 9 or more hours

On a scale of 1 to 5, how much do you agree with the following statements?

72. I mostly use IM with people that I only know in real life.

1	2	3	4	5
Disagree				Agree

73. I mostly use IM with people that I've only met online.

1	2	3	4	5
Disagree				Agree

74. The reason I use IM is to get to know other people and make friends.

1	2	3	4	5
Disagree				Agree

75. The reason I use IM is to try out being a different person from who I am in real life (i.e. be someone I can't be in real life or be someone I am not in real life).

1	2	3	4	5
Disagree				Agree

76. Do you take on a different personality when you chat using IM?

1	2	3	4	5
Not at all a different person				A totally different person on IM

77. Do you change your physical appearance (tell others that you look different than what you look like in real life) when using IM?

1	2	3	4	5
Don't really change my physical appearance on IM				My physical appearance on IM is totally different

78. I change my physical appearance over IM so that other people will view me differently from how I am seen in real life.

1	2	3	4	5
Not at all true				Very true

Appendix A (cont'd)

79. Do you prefer your IM physical appearance over your physical appearance in real life?

1	2	3	4	5	□
Do not prefer online physical appearance		Don't care		Prefer online physical appearance	Does not apply to me

80. I chat using IM to change my physical appearance (i.e. Let people think I look differently from what I look like in real life).

1	2	3	4	5
Not at all true				Very true

81. Do you change your physical abilities (pretend to be able to do things that you can't normally do in real life) when you chat using IM?

1	2	3	4	5
Don't really change my physical abilities on IM				My physical abilities on IM are totally different than in real life

82. I mostly chat using IM to change my physical abilities (i.e. Pretend to be able to do things that you really can't do in real life).

1	2	3	4	5
Not at all true				Very true

83. I change my IM physical abilities so that other people will view me differently from how I am seen in real life.

1	2	3	4	5
Not at all true				Very true

Appendix A (cont'd)

84. Do you prefer your IM physical abilities to your physical abilities in real life?

1	2	3	4	5	□
Do not prefer online physical abilities		Don't care		Prefer online physical abilities	Does not apply to me

85. The reason I chat using IM is to make close friendships

1	2	3	4	5
Not at all true				Very true

86. The reason I chat using IM is to feel accepted by others.

1	2	3	4	5
Not at all true				Very true

87. How important is chatting using IM to you?

1	2	3	4	5
Not that important				Very important

88. How many of the people that you only know online and chat with using IM would you consider to be your close friends?

1	2	3	4	5
None		Some		Most

89. How upset would you be if you had to stop chatting using IM?

1	2	3	4	5
Not at all upset				Very upset

90. How strong are the friendships you have with the people you chat with over IM?

1   2   3   4   5

Not at all Strong   Somewhat strong   Very Strong

100. How much has using IM strengthened your friendships with people you only know online?

1   2   3   4   5

Not at all   Some   A lot

101. How much has using IM strengthened your friendships with people you know in real life?

1   2   3   4   5

Not at all   Some   A lot

102. Compared to real life, do you feel more able to be yourself over IM?

1   2   3   4   5

Not at all   Somewhat   Very well

103. Do you prefer the person you are over IM better than the person you are in real life?

1   2   3   4   5   □

Prefer offline self   Don't care   Prefer online self   I am the same person online and in real life

Appendix A (cont'd)

SECTION E: EMAIL

If you use Email regularly please answer the following questions. If not, please skip to Section 2D on page 23.

104. *On average*, how many days a week do you check your Email?
a) One day a week or less
b) Between 2 and 5 days a week
c) Every day of the week

105. *On average* how many hours a week do you spend communicating over Email?
a) 1 hour or less
b) Between 2 and 5 hours a week
c) Between 8 and 10 hours a week
d) 10 or more hours a week

On a scale of 1 to 5, how much do you agree with the following statements?

106. I mostly communicate over Email with people that I only know in real life.

1	2	3	4	5
Disagree				Agree

107. I mostly use Email with people that I've only met online.

1	2	3	4	5
Disagree				Agree

108. The reason I use Email is to get to know other people and make friends.

1	2	3	4	5
Disagree				Agree

109. The reason I use Email is to try out being a different person from who I am in real life (i.e. be someone I can't be in real life or be someone I am not in real life).

1	2	3	4	5
Disagree				Agree

Appendix A (cont'd)

110. Do you take on a different personality when you communicate over Email?

1	2	3	4	5
Not at all a different person				A totally different person over email

111. Do you change your physical appearance (tell others that you look different than what you look like in real life) when using Email?

1	2	3	4	5
Don't really change my physical appearance on email				My physical appearance on email is totally different

112. I change my physical appearance over Email so that other people will view me differently from how I am seen in real life.

1	2	3	4	5
Not at all true				Very true

113. Do you prefer your Email physical appearance over your physical appearance in real life?

1	2	3	4	5	□
Do not prefer online physical appearance		Don't care		Prefer online physical appearance	Does not apply to me

114. I use Email to change my physical appearance (i.e. Let people think I look differently from what I look like in real life).

1	2	3	4	5
Not at all true				Very true

Appendix A (cont'd)

115. Do you change your physical abilities (pretend to be able to do things that you can't normally do in real life) when you chat using Email?

1	2	3	4	5
Don't really change my physical abilities on email				My physical abilities on email are totally different than in real life

116. I mostly use Email to change my physical abilities (i.e. Pretend to be able to do things that you really can't do in real life).

1	2	3	4	5
Not at all true				Very true

117. I change my Email physical abilities so that other people will view me differently from how I am seen in real life.

1	2	3	4	5
Not at all true				Very true

118. Do you prefer your Email physical abilities to your physical abilities in real life?

1	2	3	4	5	□
Do not prefer online physical abilities		Don't care		Prefer online physical abilities	Does not apply to me

119. The reason I use Email is to make close friendships

1	2	3	4	5
Not at all true				Very true

Appendix A (cont'd)

120. The reason I use Email is to feel accepted by others.

1	2	3	4	5
Not at all true				Very true

121. The reason I use Email is to do school work or to communicate with people in an impersonal way.

1	2	3	4	5
Not at all true				Very true

122. How important is using Email to you?

1	2	3	4	5
Not that important				Very important

123. How many of the people that you only know online and talk to over Email would you consider to be your close friends?

1	2	3	4	5
None		Some		Most

124. How upset would you be if you had to stop using Email?

1	2	3	4	5
Not at all upset				Very upset

125. How strong are the friendships you have with the people you communicate with over Email?

1	2	3	4	5
Not at all Strong		Somewhat strong		Very Strong

Appendix A (cont'd)

126. How much has using Email strengthened your friendships with people you only know online?

1	2	3	4	5
Not at all		Some		A lot

127. How much has using Email strengthened your friendships with people you know in real life?

1	2	3	4	5
Not at all		Some		A lot

128. Compared to real life, do you feel more able to be yourself over Email?

1	2	3	4	5
Not at all		Somewhat		Very well

129. Do you prefer the person you are over Email better than the person you are in real life?

1	2	3	4	5	☐
Prefer offline self		Don't care		Prefer online self	I am the same person online and in real life

SECTION F: NEWSGROUPS/FORUMS

If you use Newsgroups/Forums (where you post messages and wait for a reply) regularly please answer the following questions. If not, please skip to SECTION 3 on page 28.

130. What is your participation level in Newsgroups/Forums?

1	2	3	4	5
High Participation				Low participation

Appendix A (cont'd)

131. How frequently do you *respond* and *post comments* on the
Newsgroup/Forum (as opposed to just reading what other people have written)?

1	2	3	4	5

Hardly ever

Almost all the
time

On a scale of 1 to 5, how much do you agree with the following statements?

132. In terms of Newsgroups/Forums, I mostly communicate with people I know
in real life.

1	2	3	4	5
Disagree				Agree

133. In terms of Newsgroups/Forums, I mostly communicate with people I only
know online.

1	2	3	4	5
Disagree				Agree

134. The reason I use Newsgroups/Forums is to communicate with friends.

1	2	3	4	5
Disagree				Agree

135. The reason I use Newsgroups/Forums is to discuss the topic of the
Newsgroup/Forums.

1	2	3	4	5
Disagree				Agree

136. The reason I use Newsgroups/Forums is to challenge myself to be someone I
can't be in real life.

1	2	3	4	5
Disagree				Agree

Appendix A (cont'd)

137. The reasons I use Forums is to learn more about the ideas of other people.

1	2	3	4	5
Disagree				Agree

138. Do you change your physical appearance (say you look different than what you look like offline) when you communicate with people over Newsgroups/Forums?

1	2	3	4	5
Don't really change my physical appearance				My physical appearance is totally different

139. I change my physical appearance over Newsgroups/Forums so that other people will view me differently from how I am seen in real life.

1	2	3	4	5
Not at all true				Very true

140. Do you prefer your Newsgroup/Forum physical appearance over your physical appearance in real life?

1	2	3	4	5	□
Do not prefer online physical appearance		Don't care		Prefer online physical appearance	Does not apply to me

41. I mostly use Newsgroups/Forums to pretend to look different from how I look in real life.

1	2	3	4	5
Not at all true				Very true

Appendix A (cont'd)

142. I mostly use Newsgroups/Forums to pretend to be able to do things I can't physically do in real life.

1	2	3	4	5
Not at all true				Very true

143. Do you change your physical abilities (say you can do things that you can't normally do offline) when you communicate with people over Newsgroups/Forums?

1	2	3	4	5
Don't really change my physical abilities				My physical abilities are totally different

144. I change my physical abilities in Newsgroups/Forums so that other people will view me differently from how I am seen in real life.

1	2	3	4	5
Not at all true				Very true

145. Do you prefer the physical abilities you have over Newsgroups/Forums to your offline physical abilities?

1	2	3	4	5	□
Do not prefer online physical abilities		Don't care		Prefer online physical abilities	Does not apply to me

146. I use Newsgroups/Forums to make close friendships

1	2	3	4	5
Not at all true				Very true

147. I use Newsgroups/Forums to feel accepted by others.

1	2	3	4	5
Not at all true				Very true

148. How important is communicating over Newsgroups/Forums to you?

1	2	3	4	5
Not that important				Very important

149. How many of the people that you only know online and communicate with over Newsgroups/Forums would you consider to be your close friends?

1	2	3	4	5
None		Some		Most

150. How upset would you be if you had to stop communicating over Newsgroups/Forums?

1	2	3	4	5
Not at all upset				Very upset

151. How strong are the friendships you have with the people you communicate with over Newsgroups/Forums?

1	2	3	4	5
Not at all Strong		Somewhat strong		Very Strong

152. How much has Newsgroups/Forums strengthened your friendships with people you only know online?

1	2	3	4	5
Not at all		Some		A lot

Appendix A (cont'd)

153. How much has Newsgroups/Forums strengthened your friendships with people you know in real life?

1	2	3	4	5
Not at all		Some		A lot

154. Compared to real life, do you feel more able to be yourself over Newsgroups/Forums?

1	2	3	4	5
Not at all		Somewhat		Very able

155. Do you prefer the person you are over Newsgroups/Forums than the person you are offline?

1	2	3	4	5	□
Prefer offline self		Don't care		Prefer online self	I am the same person online and offline

Appendix B (cont'd)

If you decide to participate in this study, you will be asked to anonymously fill out a questionnaire that should take you about 45 minutes to complete. By anonymous, we mean that you will NOT put your name on any of the pages we give you. This means that all your answers are completely private; they cannot be made available to anyone at your school or to your parents. Some of the questions will ask you about your background. Others will ask you questions about yourself and your thoughts on computers and the Internet. There is no right or wrong answer, just your honest thoughtful answers. Those of you who decide not to participate in the project might read silently or finish your homework.

As part of this study, we will also be randomly choosing a small number of participants to interview. These interviews will either occur on-line via Instant Messenger or face-to-face. If you agree to be considered for an interview, and are chosen, you will be given the freedom to choose which form of interview you would prefer to participate in. The interview will take about 1 hour to complete. Like the questionnaire, all of your comments will be kept private. Interview questions will ask you more in-depth questions about yourself and your computer and Internet experiences. Again, there is no right or wrong answer, just your honest thoughtful answers.

It is important for you to know that participation in this study is completely voluntary, meaning that you have a choice. Even if you choose to participate in the study, you can still refuse to answer any question that you don't want to, and you can stop completing the questionnaire if you ever feel uncomfortable with continuing.

If you have any questions about your being a research participant, you may contact the Director of the UBC Office of Research Services and Administration, at 822-8598.