A Social Skill Account of Problematic Internet Use

By Scott E. Caplan

This study integrates research on social skill and self-presentation into the recently introduced cognitive-behavioral theory of generalized problematic Internet use. The model proposed and tested here predicted that individuals who lack self-presentation skill are especially likely to prefer online social interaction over face-to-face communication. Further, the model predicted that a preference for online social interaction fosters compulsive Internet use, which results in negative outcomes. Participants in this study completed measures of social skill, preference for online social interaction, compulsive Internet use, and negative outcomes associated with Internet use. Structural equation modeling analysis techniques tested the proposed model. The analysis indicated a good fit between the hypothesized model and the current data.

Research on interpersonal communication in face-to-face (FiF) settings is not only relevant but especially useful for advancing our understanding of problematic Internet use (PIU). PIU is a multidimensional syndrome consisting of cognitive and behavioral symptoms that result in negative social, academic, or professional consequences (Caplan 2002, 2003; Davis, 2001; Davis, Flett, & Besser 2002; Morahan-Martin & Schumacher, 2003). One particularly noteworthy finding to emerge from the growing literature on PIU is that individuals who report negative outcomes associated with their Internet use are especially drawn to the interpersonal uses of the Internet (Caplan, 2002, 2003; McKenna & Bargh, 2000; Morahan-Martin & Schumacher, 2000; Young, 1998; Young & Rogers, 1998).

For example, Morahan-Martin and Schumacher (2000) found that problematic Internet users were more likely than nonproblematic users to use the Internet for meeting new people, seeking emotional support, and playing socially interactive games. In another study, Young (1998) observed that, whereas nondependent Internet users spent most of their time online using email and the Web, dependent users spent most of their time online using synchronous interpersonal communication applications (i.e., chatrooms and interactive multiplayer games). In one

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review, Wallace (1999) reported that “synchronous [computer-mediated communication] spaces are not the only compelling Internet environments, but they do seem to be chief culprits in excessive Internet use” (p. 182). Although such findings raise interesting questions for researchers in a variety of disciplines, understanding the observed relationship between online social interaction and PIU should be of particular interest to communication researchers.

Surprisingly, however, communication researchers have devoted little attention to the subject. A search of the PsychINFO database revealed that, between 1996 and 2004, researchers published approximately 67 journal articles dealing with PIU, but only four (6%) were published in major communication journals (i.e., Caplan, 2003; Kubey, Lavin, & Barrows, 2001; LaRose & Eastin, 2002; LaRose, Lin, & Eastin, 2003). In response, the current article sought to demonstrate that communication researchers stand to make a valuable contribution to the emerging PIU literature.

The study reported below integrates research on FtF communication with the recently introduced cognitive-behavioral theory of generalized PIU (articles by Caplan, 2002, 2003; Davis, 2001; Davis et al., 2002) to propose a social skill account PIU. The model presented here hypothesizes that a social skill deficit, along with exposure to the Internet, predisposes an individual to develop a preference for online, rather than for FtF, social interaction, which then leads to compulsive Internet use, resulting in negative outcomes (see Figure 1). The following sections elaborate each of the above claims in further detail and report results from a study that tested the model.

Cognitive-Behavioral Model of PIU

Davis introduced a cognitive-behavioral model of PIU, contending that psychosocial problems (e.g., loneliness, depression) predispose some Internet users to exhibit maladaptive cognitions and behaviors that result in negative outcomes (Davis, 2001; Davis et al., 2002; Caplan, 2002, 2003). Results from a number of studies support the claim that psychosocial problems such as loneliness and depression are associated with PIU (Amichai-Hamburger & Ben-Artzi, 2003; Caplan, 2002, 2003; LaRose et al., 2003; Kubey et al., 2001; Morahan-Martin, 1999; Morahan-Martin & Schumacher, 2000, 2003; Shapira, Goldsmith, Keck, Khosla, & McElroy, 2000). According to Davis (2001), such psychosocial problems increase the likelihood that an individual will experience cognitive and behavioral symptoms of generalized PIU that, in turn, will result in negative outcomes.

One example of a maladaptive cognitive symptom of PIU is experiencing more positive feelings about oneself when online compared to when offline (Davis, 2001).
2001; Caplan, 2003). With regard to maladaptive behavior, Davis (2001) proposed that PIU involves compulsive Internet use to the point that the individual suffers negative outcomes at work, school, or in personal relationships. The following sections elaborate on, and make hypotheses about, how a social skill deficit increases one’s vulnerability for developing symptoms of PIU.

**Social Skill Deficits and Vulnerability to Cognitive Symptoms of PIU**

Caplan (2003) proposed that one important cognitive symptom of PIU is a preference for online, over FtF, social interaction. According to Caplan (2003) “preference for online social interaction is a cognitive individual-difference construct characterized by beliefs that one is safer, more efficacious, more confident, and more comfortable with online interpersonal interactions and relationships than with traditional FtF social activities” (p. 629). In a recent study, Caplan (2003) found that, consistent with the cognitive-behavioral model, preference for online social interaction (POSI) mediated the relationship between psychosocial problems (i.e., loneliness) and negative outcomes associated with Internet use among a sample of college students. A closer look at the research on social skill in FtF contexts helps explain how a lack of skill might predispose an individual to develop a preference for online social interaction.

An abundance of research has indicated that social skill deficits in FtF contexts are associated with the same psychosocial problems that Davis (2001) argued precipitate the development of PIU, including depression (Segrin, 1998; Segrin & Flora, 2000; Wierzbiki, 1984; Wierzbiki & McCabe, 1988), loneliness (Jones, Hobbs, & Hockenbery, 1982; Spitzberg & Canary, 1985; Spitzberg & Hurt, 1989), and social anxiety (Leary & Kowalski, 1995; Segrin, 1996; Segrin & Kinney, 1995). To explain the relationship between well-being and social skill, scholars have proposed the social-skills-deficit vulnerability hypothesis, which argues that an individual’s psychosocial well-being is threatened by a lack of interpersonal competence (Lewinsohn, Mischel, Chaplin, & Barton, 1980; Segrin, 1990, 1992, 1993, 1996; Segrin & Flora, 2000; Youngren & Lewinsohn, 1980). Segrin (1990) has maintained that a social skill deficit “enhances the likelihood of eliciting punishment from the social environment” (p. 293). Examples of such punishments include interpersonal rejection, embarrassment, and relationship failure.

In general, social skill reflects “the ability to interact with other people in a way that is both appropriate and effective” (Segrin & Givertz, 2003, p. 136; also see Bedell & Lennox, 1997; Spitzberg, 2003; Spitzberg & Cupach, 1989; McFall, 1982). Riggio (1989; Riggio & Zimmerman, 1991) identified six different dimensions of social skill: emotional expressivity, emotional sensitivity, emotional control, so-

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3 For a thorough discussion of each of the six dimensions of social skills, see Riggio (1989) and Riggio and Zimmerman (1991). Emotional expressivity skill refers to one’s ability to send nonverbal messages that express emotion, attitude, and conversational cues. Emotional sensitivity skill refers to competence with interpreting others’ nonverbal expressions. Emotional control skill involves one’s ability to convey emotions on cue or to hide unwanted emotions. Social expressivity skill pertains to verbal message production ability. Social sensitivity skill refers to one’s verbal message reception and interpretation skills. Social control skill, which is most relevant for the current study, involves one’s self-presentational competence.
cial expressivity, social sensitivity, and social control. The current study focuses specifically on social-control skill, an individual’s competence at self-presentation, role taking, and impression management in FtF interpersonal interactions.

In most interpersonal encounters, people engage in a wide range of strategic self-presentation behaviors to make positive impressions of themselves on others (Goffman, 1959). Riggio (1989) explained that “persons whose self-presentation skills are well developed are generally adept, tactful, and self-confident in social situations and can fit in comfortably in just about any type of social situation” (p. 3). However, when individuals lack confidence in their self-presentation skills, they experience social anxiety (Leary, 1983; Leary & Kowalski, 1995; Segrin & Kinney, 1995; Schlenker & Leary, 1985). For example, in one study, Segrin and Kinney (1995) found that, although socially anxious individuals’ behavior did not differ significantly from that of nonanxious individuals, socially anxious participants negatively misperceived their own social skills.

In order to increase their perceived self-presentation ability and to decrease social risk, people with social-control skill deficits are likely to seek out communicative channels (such as CMC) that minimize potential costs and enhance their limited abilities. O’Sullivan (2000) maintained that CMC represents a useful tool “for managing self-relevant information in pursuit of self-presentation goals (p. 404). In one study, O’Sullivan examined preference for different interpersonal communication channels (e.g., CMC, FtF, telephone) and found that people’s preferences varied depending on the extent to which they appraised a self-presentation situation as threatening or supportive. Specifically, O’Sullivan’s participants preferred mediated interpersonal channels when their self-presentation was threatened. As the following discussion explains, individuals with a social-control skill deficit should be more likely than others to be attracted to the unique features of online social interaction.

The model presented here (Figure 1) hypothesizes that individuals who perceive themselves as having low self-presentation skill should be more motivated than their counterparts to prefer online social interaction because they perceive their self-presentation skill in online social interaction to be greater than in FtF interaction (see McKenna & Bargh, 1999). FtF interaction and synchronous computer-mediated communication differ from one another in ways that should be especially appealing to those who perceive themselves to have low self-presentation skills (for detailed reviews of these differences, see Hancock & Dunham, 2001; Ramirez, Walther, Burgoon, & Sunnafrank, 2002; Walther & Parks, 2002). Compared to FtF conversation, synchronous online social interaction often entails greater anonymity (see Bargh, McKenna, & Fitzsimmons, 2002; McKenna & Bargh, 1999, 2000; McKenna, Greene, & Gleason, 2002), greater control over self-presentation and impression formation (Bargh et al., 2002; Cornwell & Lundgren, 2001; Noonan, 1998; O’Sullivan, 2002; Walther, 1996), and less perceived social risk (Morahan-Martin & Schumacher, 2000; Walther, 1996). In general, the literature suggests that CMC interactants are more selective and strategic in their self-presentation, form more idealized impressions of their partners, and, consequently, engage in more intimate exchanges than people in FtF situations (Lea & Spears, 1992; Reicher, Spears, & Postmes, 1995; Spears & Lea, 1992, 1994; Tidwell &
Walther, 2002; Walther, 1993, 1996; Walther & Burgoon, 1992). As Davis et al. (2002) argued, “for some individuals, the Internet becomes a buffer for threatening social interactions” (p. 332). Results of a study by Morahan-Martin & Schumacher (2000) also support these assertions. In a study of PIU and loneliness, the researchers reported that

[problematic Internet] users gained social confidence online. They are friendlier, more open, and more themselves, and they report it easier to make friends when online. They have more fun with people online than [nonproblematic] users and are more likely to share intimate secrets online as well. (p. 26).

The next section explains the hypothesized influence of preference for online social interaction on maladaptive behavioral symptoms of PIU (see Caplan, 2002, 2003; Davis, 2001).

Compulsive Internet Use

In addition to clarifying the associations among social skill, POSI, and PIU, a second goal of the current study was to test the hypothesis that compulsive Internet use mediates the influence of POSI on negative outcomes. When individuals with a self-presentational skill deficit develop a preference for online social interaction, they may devote increasingly more resources (e.g., time, money, and attention) to their online social lives; their careers and F2F relationships may quickly become secondary priorities. For example, Davis et al. (2002) argued that for socially reticent individuals, online social interaction is “a social liberating experience [that] might motivate increased dependence on the Internet as a means of communicating with others” (p. 332). Davis et al. (2002) go on to explain that “the process occurs as individuals confine themselves to virtual communications and reduce time spent engaging in face-to-face interactions” (p. 332). In other words, when individuals’ primary use of the Internet is synchronous online social interaction, it becomes harder for them to control their Internet use and devote sufficient effort to their F2F relationships.

Compulsive and excessive Internet use are closely related, but conceptually distinct, behavioral patterns. Excessive Internet use refers to a quantity, or degree, of online activity that exceeds what a person thinks of as a normal, usual, or planned amount of time online, whereas compulsive use involves difficulty with impulse control (Caplan, 2002). Spending an excessive amount of time online is not necessarily indicative of a problem—many functional Internet behaviors require excessive time online. For example, a student may spend what many would consider to be an excessive amount of time online, but such effort may be necessary in order for the student to successfully complete an assignment.

Compulsive, rather than excessive, Internet use is more likely to result in negative outcomes. Indeed, a number of researchers have maintained that PIU primarily involves compulsive Internet use (for a review, see Beard & Wolf, 2001; see also Caplan, 2003; Davis, 2001; Griffiths, 2000; Shapira et al., 2000; Young, 1998; Young & Rogers, 1998). In one study, Caplan (2003) compared the extent to which excessive Internet use and compulsive Internet use predicted negative out-
comes associated with PIU. Caplan (2003) found that both excessive and compulsive Internet use were significant predictors of negative outcomes associated with Internet use but also reported that "excessive use was one of the weakest predictors of negative outcomes, whereas preference for online social interaction, compulsive use, and withdrawal [another cognitive predictor] were among the strongest" (pp. 637–638). In another study, Shapira et al. (2000) interviewed people suffering from PIU (defined as engaging in Internet use that was uncontrollable, distressing, time-consuming, or resulted in negative outcomes) and found “all (100%) subjects’ problematic Internet use met the DSM-IV (American Psychiatric Association, 1994) criteria for an impulse control disorder” (p. 267). Shapira et al. (2000) concluded that, “based on the current limited empirical evidence, problematic Internet use may best be classified as an impulse control disorder” (p. 207).

The model presented above seeks to explain why PIU is associated with interpersonal Internet use. The model predicts that individuals who perceive themselves to lack self-presentational skill are especially likely to perceive online social interaction more favorably than they perceive FtF communication. Over time, the model predicts, a preference for online social interaction leads to compulsive Internet use that results in negative outcomes.

Focus of Current Study
The conceptual model proposed and tested in the current study hypothesized that a self-presentational skill deficit increases the likelihood that an individual will develop a preference for online social interaction (see Figure 1). The model further predicted that POSI increases the likelihood that an individual will engage in compulsive Internet use that results in negative outcomes. Specifically, the current study tested the following direct effect hypotheses:

H1: One’s perceived level of self-presentational skill has a direct negative influence on POSI.
H2: POSI has a direct positive influence on level of compulsive Internet use.
H3: Level of compulsive Internet use has a direct positive influence on negative outcomes associated with Internet use.

The current study also tested the following indirect effect hypotheses:

H4: POSI has an indirect positive influence on negative outcomes that is mediated by compulsive Internet use.
H5: One’s perceived level of self-presentational skill has an indirect negative effect on compulsive Internet use that is mediated by POSI.

Methods
Participants
Participants were 251 undergraduate students with a variety of different majors who were enrolled in an introductory communication class (70% female) ranging in age from 18 to 32 years old ($M = 19.8$; $Median = 19$; $SD = 1.42$ years). To test the
model presented above, the current study required a homogenous sample of individuals who frequently use the Internet. As Calder, Phillips, and Tybout (1981) explained, homogenous samples "decrease the chance of making false conclusions about whether there is covariation between the variables under study" (p. 200). Participants were students at a university where Internet use is extremely high, almost every student (approximately 98%) owns his or her own computer, and all residence hall rooms have direct Internet connections.

Variables and Measures

**Self-presentational social skill.** The current study employed the social control subscale of the widely used Social Skill Inventory (SSI; Riggio, 1989) to operationalize self-perceived skill at interpersonal impression management. The social control subscale of the SSI consists of three sets of 15 self-report items assessing one’s skill in role playing and social self-presentation. Examples of items from the social control subscale include, “When in a group of people, I have trouble thinking of the right things to talk about,” “I can easily adjust to being in just about any social situation,” and “I often find myself in awkward social situations” (see Riggio, 1989, for wording of all items on the SSI). Participants rated their agreement with each item on a scale ranging from 1 (strongly disagree) to 5 (strongly agree). The means of each of the three sets of social-control skill items served as indicators of the latent construct self-presentational skill in an SEM analysis. As with previous estimates of the subscale’s interitem reliability (e.g., Riggio, 1989), Cronbach’s alpha coefficient in the current study was high (α = .87).

**Preference for online social interaction.** The items employed as indicators of POSI were based on a measure reported by Caplan (2003). Specifically, participants rated their agreement on a scale ranging from 1 (strongly disagree) to 5 (strongly agree)—with the following statements: “I prefer communicating with other people online rather than face-to-face,” “I feel like I have more control over conversations online than I do in face-to-face conversations,” and “Meeting and talking with people is better when done online rather than in face-to-face situations.” In the current study, reliability among the scale items was α = .76. Each item served as an indicator of the latent POSI in the SEM analysis reported below.

**Compulsive Internet use.** Compulsive Internet use was measured with the compulsive use subscale of the Generalized Problematic Internet Use Scale (GPIUS; Caplan, 2002). The compulsive use subscale asks participants to rate the extent to which they agree with the following statements: “I have made unsuccessful attempts to control my Internet use,” “I am unable to reduce the amount of time I spend online,” and “I have tried to stop using the Internet for long periods of time.” Participants rated their agreement with each item on a scale ranging from 1 (strongly disagree) to 5 (strongly agree). Each item served as an indicator of the latent compulsive Internet use in the SEM analysis reported below.

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4 Riggio (1999) explained that, “due to the length of the SSI, the items for each of the [sub]scales were grouped into sets (“parcels” of five items each), resulting in a total of 18 item sets. . . [and that] . . . care was taken to ensure that the sets were heterogeneous regarding the content of items within a particular set” (p. 15).
an indicator of the latent compulsive Internet use variable in the SEM analyses. The reliability of the compulsive Internet use subscale for the current study was ($\alpha = .87$).

**Negative outcomes of Internet use.** Negative outcomes were measured with a subscale of items from the GPIUS (Caplan, 2002). The negative outcomes subscale asks participants to rate the extent to which they agreed or disagreed with the following items: “I have missed class or work because of being online” and “I have gotten in trouble at work or school because of my Internet use.” Participants rated their agreement with each item on a scale ranging from 1 (strongly disagree) to 5 (strongly agree). Each item served as an indicator of the latent negative outcomes variable in the SEM analyses. In the current study, the reliability coefficient for the negative outcomes subscale items was $\alpha = .76$.

**Analyses**

The descriptive statistics for each observed variable, along with results of a correlation analysis of these variables, appear in Tables 1 and 2. An SEM analysis simultaneously tested all five hypotheses presented above. SEM analysis can involve both observed variables and latent variables and three types of relationships between variables: direct effects, indirect effects, and total effects (Holbert & Stephenson, 2002; Hoyle, 1995). Indirect effects involve the influence of an independent variable on a dependent variable that is mediated by some third variable (Baron & Kelly, 1986; Hoyle, 1995). The current study assessed direct effects and decomposed total effects in order to determine indirect effects. The SEM analysis reported below was computed with AMOS 5.0 (Arbuckle, 2003).

**Results**

The SEM analysis reported here employed a full-information maximum likelihood estimation procedure. Figure 1 illustrates the specific structural model representing hypotheses that were tested in the current study, along with the standardized estimated path coefficients obtained with the current study’s SEM analysis. Several indices suggest the model fit the data well, $\text{CFI} = .95$, $\text{ECVI} = .58$, $\text{SRMR} = .08$, $\text{BIC} = -131.73$; $\text{RMSEA} = .07$ (90% CI: .053-.092); $p$ close to fit = .03. For purposes of model comparison, $\chi^2 = 94.81$, $df = 41$, $p < .001$.

**Direct Effect Hypotheses**

The data supported H1; participants’ self-presentational skill was a significant negative predictor of POSI, $\beta = -.40$, $p < .001$. The results also supported H2; participants’ level of POSI was a positive predictor of their level of compulsive Internet use, $\beta = .48$, $p < .001$. Additionally, the data supported H3; participants’ level of compulsive Internet use was a positive predictor of negative outcomes,

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5 All $\beta$ coefficients reported in the current article are standardized.
Indirect Effect Hypotheses

H4 and H5 were both tested with a distribution of product coefficients (P) test developed by MacKinnon, Lockwood, and Hoffman (1998). Monte Carlo analyses of different indirect effects tests indicate that the distribution of product coefficients test has greater statistical power and does a better job of maintaining an accurate Type I error rate than other available procedures (MacKinnon, Lockwood, Hoffman, West, & Sheets, 1998; also see Holbert & Stephenson, 2003). The current data supported the hypothesized negative indirect effect of social skill on compulsive Internet use, mediated by POSI (H4), $P = -29.84$, $p < .001$. The data also supported the hypothesized positive indirect effect of POSI on negative outcomes, mediated by compulsive use (H5), $P = 9.23$, $p < .001$. Finally, the predictors in the model (i.e., self-presentational skill, POSI, and compulsive use) together accounted for 10% of the variance in negative outcome scores.
Discussion

As noted earlier, one particularly noteworthy finding to emerge from the growing literature on PIU is that individuals who report negative outcomes associated with their Internet use are especially drawn to the interpersonal uses of the Internet. The purpose of the current study was to employ theory and research on communication in FtF contexts to help understand why PIU is related to interpersonal Internet use. Toward this end, the current study introduced and tested a social skill account of PIU. In general, the model predicted that individuals who perceive themselves as lacking self-presentational skill would be especially likely to perceive online social interaction more favorably than FtF communication. Moreover, the model predicted that a preference for online social interaction leads to compulsive Internet use that results in negative outcomes. Overall, the results of the SEM analysis indicated that the current data did fit the conceptual model presented in Figure 1. The following paragraphs address the specific findings associated with each of the five hypotheses advanced earlier.

The first hypothesis predicted that one’s self-presentational skill would have a negative direct influence on POSI. The data reported above support this hypothesis, self-presentational social skill was a strong negative predictor of POSI. A second goal of the study was to test the hypothesis that compulsive Internet use stems from a heightened preference for online social interaction. Specifically, H2 predicted that one’s preference for online social interaction would have a direct positive influence on level of compulsive Internet use. The results reported above support this hypothesis: Preference for online social interaction was a significant positive predictor of compulsive use.
Next, H3 predicted that one's level of compulsive Internet use would have a direct positive influence on the likelihood one would experience negative outcomes. The data supported H3: Compulsive use was a significant positive predictor of negative outcomes. Thus, the current data supported all three direct effect hypotheses.

Finally, H4 and H5 both predicted relationships with indirect effects. The data supported H4, which proposed that POSI has an indirect positive influence on negative outcomes that is mediated by compulsive Internet use. Additionally, the results supported H5, which predicted that one's perceived level of self-presentational skill has an indirect negative effect on compulsive Internet use that is mediated by POSI.

In sum, the results reported above support the processes specified in the cognitive-behavioral model of PIU, in which a deficit of self-presentational social skill leads to a preference for less risky social interaction online. On the face of it, it seems that participants who prefer online social interaction might consider CMC a functional alternative to their FtF interactions. However, the results presented above suggest otherwise; participants’ preference for online social interaction predicted the degree to which they reported an inability to control impulses to use CMC. The following sections identify limitations of the current study and offer recommendations for future research.

Although encouraging, the results reported above require some qualification. The study of computer-mediated interpersonal communication is quite new. As such, the current study represents an initial step toward developing and testing a new theory of online social interaction and PIU. The model tested here represents a nascent theory, and the study’s goal was to support the most basic aspects of the theory. Thus, limitations of the current study are worth addressing in order to recommend directions for future research.

| Table 2. Zero-order Pearson Correlation Matrix for Observed Variables |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| (1)                | (2)                | (3)                | (4)                | (5)                | (6)                | (7)                | (8)                | (9)                |
| SSISC1            | 1                |                |                |                |                |                |                |                |
| SSISC2            | .71**            | 1                |                |                |                |                |                |                |
| SSISC3            | .70**            | .68**            | 1                |                |                |                |                |                |
| POSI1             | -.25**           | -.21**           | -.28**           | 1                |                |                |                |                |
| POSI2             | -.19**           | -.23**           | -.28**           | .52**           | 1                |                |                |                |
| POSI3             | -.24**           | -.25**           | -.28**           | .54**           | .59**           | 1                |                |                |
| Compulsive use 1 | -.07             | -.09             | -.21**           | .17**           | .26**           | .26**           | 1                |                |
| Compulsive use 2 | -.12             | -.18**           | -.20**           | .18**           | .32**           | .24**           | .72**           | 1                |
| Compulsive use 3 | -.21**           | -.19**           | -.26**           | .23**           | .25**           | .32**           | .51**           | .46**           | 1                |
| Neg. outcome 1   | -.12             | -.06             | -.15*            | .26**           | .25*            | .34**           | .18**           | .21**           | .26**           | 1                |
| Neg. outcome 2   | -.11             | -.08             | -.22*            | .34**           | .19**           | .32**           | .18**           | .18**           | .22**           | .68**           |
First, given that the current study employed a cross-sectional rather than longitudinal design, it is impossible to determine causality with the current data. However, SEM does allow researchers to determine whether or not data support hypothesized causal associations. In the current study, the SEM results did offer substantial support to the hypothesized model.

Second, as with most early tests of nascent theories, the current study employed a student sample. Although future studies should begin to specify the theoretical boundaries of the model presented above, results from a student sample are useful for initial hypothesis testing and theory building, especially when examining multivariate relationships6 (Calder et al., 1981; Basil, Brown, & Bocarnea, 2002; Shapiro, 2002).

A third limitation of the current study was that the model accounted for only 10% of the variance in negative outcome of Internet use scores. Researchers need to begin to identify other exogenous variables that increase the explanatory power of the model proposed here. For example, the current study employed one cognitive and one behavioral predictor of negative outcomes. Future studies may benefit from identifying multiple cognitive and behavioral predictors.

Additionally, future research should begin to investigate the relative influence of both generalized PIU and specific PIU symptoms (Davis, 2001) on negative outcomes. Although the current study was focused on generalized PIU because of its association with interpersonal Internet use, one question for researchers to address is how generalized and stimuli-specific Internet use processes are similar or different from one another.

In addition to its relevance to research on PIU, the current study also raises several interesting questions for interpersonal communication researchers. For example, do people perceive themselves as having different levels of social skill online than they have in FtF interactions? In other words, do people have an “online social skill” that differs from their “FtF social skill”? Are online social interactions and relationships as fulfilling and as functional for satisfying one’s interpersonal needs as traditional FtF relationships are? Finally, are there functional or positive effects of preference for online social interaction? Research designed to address the above questions will help advance the growing literature on the association between Internet use, psychosocial well-being, and interpersonal communication.

Shapiro (2002) argued that “rejecting a study that seeks to expand theory and that detects a potentially important effect on the basis of a nonrandom sample usually reflects a misunderstanding of the nature of generalizability. If a study detected an important effect, no matter what kind of sample is used, it is clearly true for some group of people, in some setting, at some time, for some message. The next step may be to conduct theoretically driven boundary search to determine to whom the effect applies and to whom it does not” (p. 499). Moreover, Calder et al. (1981) explained that when “making theoretical generalizations, a representative sample is not required because statistical generalization of the findings is not the goal. It is the theory that is applied beyond the research setting. The research sample need only allow a test of the theory. And, any sample within the theory’s domain (e.g., any relevant sample), not just a representative one, can provide such a test” (p. 200).
References


