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Preference for Online Social Interaction

A Theory of Problematic Internet Use and Psychosocial Well-Being

The model introduced and tested in the current study suggests that lonely and depressed individuals may develop a preference for online social interaction, which, in turn, leads to negative outcomes associated with their Internet use. Participants completed measures of preference for online social interaction, depression, loneliness, problematic Internet use, and negative outcomes resulting from their Internet use. Results indicated that psychosocial health predicted levels of preference for online social interaction, which, in turn, predicted negative outcomes associated with problematic Internet use. In addition, the results indicated that the influence of psychosocial distress on negative outcomes due to Internet use is mediated by preference for online socialization and other symptoms of problematic Internet use. The results support the current hypothesis that that individuals' preference for online, rather than face-to-face, social interaction plays an important role in the development of negative consequences associated with problematic Internet use.

Keywords: *problematic Internet use; preference for online social interaction; computer-mediated communication; loneliness; interpersonal communication; face-to-face communication*

Research on computer-mediated communication (CMC) has identified new and unique interpersonal phenomena in cyberspace (Barnes, 2001; Caplan, 2001; Walther, 1996). Yet, an equally—if not more—important task involves extending prior research on face-to-face (FtF) communication to the new forms of computer-mediated communication. Such research can illuminate not only CMC research but also shed light in an interesting way on more basic

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questions about interpersonal communication that are now more complex and interesting due to new communication technology.[1]

One communication phenomenon of great interest, and subject to much debate, in both popular and academic literature is the association between Internet use and psychosocial health (e.g., depression and loneliness). Research from a variety of disciplines, including communication, reflects a growing concern with compulsive Internet use and its potential ill effects (for reviews, see Beard & Wolf, 2001; Brenner, 1997; Davis, 2001; Griffiths, 1996, 1997, 1998, 2000; Young & Rogers, 1998). Some have gone so far as to speculate that the Internet offers addictive potential (e.g., Young, 1996, 1998; Young & Rogers, 1998; for critiques of the Internet addiction perspective, see Shaffer, Hall, & Vander Bilt, 2000; Surratt, 1999; Walther, 1999).

Currently, the available research on Internet use and psychosocial health is ambiguous. In one highly publicized study (e.g., Caruso, 1998; Harmon, 1998), Kraut and colleagues (1998) administered depression and loneliness scales to participants before they began to use the Internet for the first time and again 1 year later. Kraut et al. found that, over time, both depression and loneliness increased with the amount of time a person spent online. In a follow-up study, however, Kraut and colleagues (Kraut et al., 2002) reported that the observed negative effects of Internet use had faded. In addition, they conducted another longitudinal assessment of Internet use and psychological well-being with a sample of new computer and television purchasers but were unable to replicate their earlier findings. Similarly, Wästerlund, Norlander, and Archer (2001) measured self-reported amount of time spent on Internet use along with depression and loneliness and found no significant correlations among mental health variables and time spent online. One reason such findings are difficult to interpret is that the current literature lacks detailed theories explaining why some people seem to have problematic relationships with their Internet use (see Beard & Wolf, 2001; Davis, 2001; Wallace, 1999; Weiser, 2001).

The theory introduced in the current article proposes that problematic psychosocial predispositions lead individuals to excessive and compulsive computer-mediated social interaction, which, in turn, worsens their problems. Excessive Internet use, in the current study, is defined as a quantity or degree of use that is considered by the participant to exceed a normal, usual, or planned amount of time online. On the other hand, compulsive use involves an inability to control one's online activity along with feelings of guilt about the lack of control. The term *problematic Internet use* (PIU) is employed here to characterize those maladaptive cognitions and behaviors involving Internet use that result in negative academic, professional, and social consequences (Caplan, 2002; Davis, 2001; Davis, Flett, & Besser, 2002).

Specifically, the term *problematic* refers to usage reflecting a specific cycle of innate dysfunction leading to Internet use that in turn exacerbates the dysfunction.[2]

The current study draws on research from the broader literature on interpersonal communication and psychosocial health in non-computer-mediated contexts to explicate a cognitive-behavioral model of the association between PIU and psychosocial well-being. The theory presented here demonstrates the relevance of interpersonal communication research to the study of PIU and well-being by highlighting the role that interpersonal CMC processes play in the relationship between Internet use, or misuse, and well-being. Indeed, communication scholars have much to offer toward advancing our understanding of PIU and health.

Grounded in Davis's (2001) early work, the theory advanced here proposes the following: (a) individuals who suffer from psychosocial problems (i.e., depression and loneliness) hold more negative perceptions of their social competence than people without such problems; (b) these individuals develop a preference for online social interaction as an alternative to FtF communication because they perceive it to be less threatening and perceive themselves to be more efficacious when interacting with others online; (c) a preference for online social interaction leads to excessive and compulsive computer-mediated social interaction, which, in turn, worsens their problems and also creates problems at home, school, and work. Each of these claims is elaborated in further detail in the following pages.

Psychosocial Well-Being and Perceived Interpersonal Competence

The first theoretical assumption introduced above is that individuals who suffer from psychosocial distress, such as loneliness and depression, hold negative perceptions of their own social competence. Extant research on psychosocial health and interpersonal communication competence offers robust support for this claim.

First, with regard to loneliness, considerable empirical evidence indicates a significant negative relationship between loneliness and both self- and observer-ratings of one's social skill (Jones, 1982; Jones, Hobbs, & Hockenbury, 1982; Prisbell, 1988; Riggio, Throckmorton, & DePaola, 1990; Segrin, 1993, 1996, 2000; Segrin & Flora, 2000; Spitzberg & Canary, 1985; Spitzberg & Hurt, 1987). For example, Spitzberg and Hurt (1987) found that an individual's degree of loneliness was negatively related to his or her self-rating of interpersonal competence. In a study on loneliness and

interpersonal competence among HIV-infected men, Straits-Troester, Patterson, Semple, and Temoshok (1994) found that lonely participants rated themselves as significantly less competent in both initiating and managing social relationships than nonlonely participants. Similarly, in a study on loneliness and interpersonal skill in dating situations, Prisbell (1988) concluded that lonely people reported having greater difficulty with initiating FtF social activity, less interest in FtF social activity, and perceived FtF social activity to be less rewarding than nonlonely people. Segrin and Flora (2000) conducted a longitudinal analysis in which they assessed self-reported social skill and psychosocial well-being (i.e., loneliness, depression, and social anxiety) at two different times over the course of several months. Consistent with the negative association identified in the other studies mentioned above, results from Segrin and Flora's study indicated that individuals with lower social skills at Time 1 were more vulnerable to the development of psychosocial problems at Time 2.

Segrin and Flora (2000) found that individuals' self-ratings of social competence also predicted depression. Indeed, a number of studies have found depression to be related to negative perceptions of one's own social competence, as well as negative evaluations of social competence by peers and other observers (for a review, see Segrin, 2000). For example, Gable and Shean (2000) had participants complete a depression inventory, engage in an FtF interaction with another participant and then complete measures of their own and their partner's social competence. Gable and Shean found that depressed participants rated themselves and their partners (regardless of the partner's level of depression) as less socially competent than did nondepressed participants. Gable and Shean concluded "depressed individuals have a trait-like bias to perceive themselves and others in a negative manner" (p. 139). In sum, the literature reviewed above demonstrates that individuals who suffer from loneliness and depression are likely to perceive themselves as having relatively low competence in the interpersonal domain. For the purposes of the current study, this association serves as a rationale for the second theoretical claim introduced earlier, which is explained in the next section.

Preference for Online Social Interaction

Self-perceptions of social incompetence may lead lonely and depressed people to seek out what they perceive to be a safer and less threatening alternative to FtF interaction. McKenna, Green, and Gleason (2002) argued that lonely individuals are "somewhat more likely to feel that they can better express their real selves with others on the Internet than they can with those they

know offline" (p. 28). The argument advanced here is that individuals who are lonely and depressed are more likely than psychosocially healthier people to develop a preference for online social interaction. 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. As the following paragraphs explain, there are several different reasons why psychosocially distressed individuals might develop a strong preference for online social interaction.

Researchers have identified a variety of unique aspects of some synchronous[3] CMC applications that may be especially appealing to psychosocially distressed individuals. There are a number of characteristics of online synchronous communicative environments that differ from FtF interaction such that CMC should be especially appealing to people trying to cope with loneliness, depression, and low-self esteem (for extensive discussions, see Barnes, 2001; Turkle, 1995; Wallace, 1999; Walther, 1996). For instance, CMC in an online chat room entails greater anonymity, greater control over self-presentation, more intense and intimate self-disclosure, less perceived social risk (i.e., diminished personal cost if interactions or relationships fail), and less social responsibility toward others and the interaction than in traditional FtF communication (Morahan-Martin & Schumacher, 2000; Turkle, 1995, Wallace, 1999; Walther, 1996). Most scholars agree that because of the reduced nonverbal cues in many CMC applications, interactants experience a greater sense of anonymity online than in FtF exchanges (see Bargh, McKenna, & Fitzsimmons, 2002; McKenna & Bargh, 1999, 2000; McKenna et al., 2002). In some cases, the heightened anonymity online allows CMC participants to engage in more exaggerated, idealized, and deceptive self-presentation than is possible in FtF interaction (Cornwell & Lundgren, 2001; Noonan, 1998). The following discussion examines these features in further detail.

A number of theories describe ways in which interpersonal processes in some CMC applications are distinct from those in FtF interaction (see Hancock & Dunham, 2001; Ramirez, Walther, Burgoon, & Sunnafrank, 2002). Briefly, the cues-filtered out (CFO) perspective suggests that some forms of CMC are relatively more depersonalized than FtF activity because of the reduced number of contextual and nonverbal cues (Culnan & Markus, 1987). From this perspective, the lack of available cues in CMC creates a heightened sense of anonymity, which leads to a more impersonal communication exchange than in FtF interaction. The social identification model of deindividuation effects (SIDE) proposes that CMC is not necessary impersonal, rather impression formation online results in more socially

categorical, rather than personal, impressions of others (Lea & Spears, 1992; Reicher, Spears, & Postmes, 1995; Spears & Lea, 1992, 1994; Spears, Postmes, & Lea, 2002). Along a similar line, social information-processing theory (Walther, 1993; Walther & Burgoon, 1992) also rejects the notion that CMC is necessarily impersonal; instead, it suggests that interpersonal relationship development online requires more time to develop than traditional FtF relationships.

Walther (1996) has suggested that some forms of CMC may be more advantageous to traditional FtF behavior for some interpersonal endeavors because CMC facilitates so-called hyperpersonal communication that surpasses normal levels of interpersonal exchange. According to Walther, the reduced number of available nonverbal cues increase editing capabilities, and the temporal features of CMC allow interactants to be more selective and strategic in their self-presentation, form idealized impressions of their partners, and, consequently, engage in more intimate exchanges than people in FtF situations (Tidwell & Walther; 2002; Walther, 1993, 1996; Walther & Burgoon, 1992). Ramirez et al. (2002) proposed that "although most CMC environments eliminate or severely reduce nonverbal and contextual information available to address uncertainty, form impressions, and develop relationships, such environments offer alternative mechanisms for acquiring social information about others" (p. 213). Some of these alternatives may be especially appealing to individuals who perceive themselves to be low in interpersonal competence.

Prior research supports a number of the claims mentioned above. In one study comparing FtF to CMC romantic relationships, Cornwell and Lundgren (2001) found CMC partners engaged in greater misrepresentation during self-presentation that their FtF counterparts. Cornwell and Lungren attributed the difference in levels of misrepresentation to differences in relational involvement; they found that there was a lower level of relational involvement among CMC romantic partners compared to those using an FtF channel. Joinson (2001) examined levels of self-disclosure between CMC and FtF interactions, hypothesizing that self-disclosure levels would be greater in CMC than FtF because of the increased private self-awareness, the decreased public self-awareness, and increased visual anonymity in CMC. First, Joinson found that levels of spontaneous self-disclosure were greater in CMC exchanges than in FtF interactions. In addition, Joinson found that levels of spontaneous self-disclosure were higher when there was a heightened sense of private self-awareness and a lower sense of public self-awareness. Other researchers have reported that compared to FtF interactions, CMC exchanges include more direct and more intimate uncertainty reduction

strategies (Tidwell & Walther, 2002), along with less detailed and more intense impressions of partners (Hancock & Dunham, 2001).

Taken together, the literature reviewed here identifies a number of features of some CMC applications that might be particularly attractive to people who perceive themselves as being low in social competence. First, with regard to self-disclosure, CMC interaction allows individuals greater flexibility in self-presentation; people may omit and falsify personal information that they perceive to be negative or harmful. In addition, there is greater opportunity to fabricate, exaggerate, or intensify more positive aspects of one's self to others online. Thus, for some, the Internet represents a place where they can exercise greater control over the impressions that others form of them. Second, as Tidwell and Walther (2002) found, participants in FtF conversations exhibit a greater repertoire of uncertainty reduction, self- disclosure, and politeness strategies than those in CMC interactions. Overall, Tidwell and Walther reported that effective FtF communication demands greater communicative flexibility and creativity than CMC interaction.

Thus, a preference for online social interaction may develop from one's perceptions that CMC is relatively easier (i.e., requiring less interpersonal sophistication), less risky (e.g., greater anonymity, heightened sense of private self-awareness, and lower sense of public self-awareness), and more exciting (e.g., more spontaneous, intense, and exaggerated; more personal self-disclosure; decreased adherence to social norms) than FtF communication. In sum, the world of synchronous online interpersonal communication is "hard for any humdrum reality to compete with, especially for people whose real lives are troubled" (Wallace, 1999, p. 182).

For psychosocially distressed individuals, Morahan-Martin and Schumacher (2000) maintain "the Internet can be socially liberating, the Prozac of social communication" (pp. 25-26). Consistent with this position, both Shotton (1991) and Davis (2001) argued that the Internet itself does not make people isolated; rather, it is loneliness or isolation that attracts people to online social interaction and CMC relationships in the first place. In other words, according to Davis, psychosocial distress predisposes some individuals to experience problematic Internet use. The argument advanced in the current article goes further to suggest that psychosocial distress leads some individuals to develop a preference for online social interaction, which then sets the stage for problematic Internet use. Accordingly, the current study sought to test the following hypothesis:

Hypothesis 1: Psychosocially distressed individuals have a stronger preference for online social interaction than nondistressed individuals.

The final argument advanced at the beginning of this article was that a preference for online social interaction leads to compulsive and excessive computer-mediated social interaction along with other cognitive and behavioral symptoms of PIU, which, in turn, worsens psychosocially distressed individuals' problems. PIU includes a host of maladaptive cognitions and behaviors associated with Internet use (i.e., PIU), including excessive or compulsive use resulting in negative personal and professional outcomes (Anderson, 2003; Caplan, 2002; Davis, 2001; Davis et al., 2002).

Davis's (2001) cognitive-behavioral model of PIU hypothesizes that psychological pathology or distress (e.g., loneliness, depression, etc.) predisposes an individual to develop PIU. Davis argued that maladaptive cognitive distortions about CMC are important features of PIU. Examples of these maladaptive cognitions include such thoughts as, "'I am only good on the Internet,' 'I am worthless offline, but online I am someone,' and 'I am a failure when I am offline'" (Davis, 2001, p. 191). Other maladaptive cognitions include all-or-nothing distortions about the world. For example, an individual might think, "'the Internet is the only place I am respected,' 'Nobody loves me offline,' 'the Internet is my only friend,' or 'people treat me badly offline'" (pp. 191-192). Davis's cognitive-behavioral model of PIU describes, "a vicious cycle of cognitive distortions and reinforcement that lead to behaviors that result in problematic outcomes associated with spending too much time online" (p. 194).

Recently, Caplan (2002) identified a number of cognitive and behavioral symptoms of PIU, including the following: mood alteration (using the Internet to facilitate some change in negative affective states), perception of social benefits online (the perceived social benefits of Internet use), compulsive use (the inability to control one's online activity along with feelings of guilt about the lack of control), excessive use (use that is considered to be exceeding a normal, usual, or planned amount of time online, or even losing track of time when using the Internet), withdrawal (difficulties with staying away from the Internet), and perceived social control (perception of greater social control when interacting with others online compared to FtF). Caplan reported that each of these cognitive and behavioral symptoms was significantly correlated with negative outcomes resulting from one's Internet use.

Two of the maladaptive cognitions identified by Caplan (2002) that involve interpersonal communication (i.e., perceived online social benefits and perceived online social control), closely resemble the preference for online social interaction construct that is central to the current study. In fact, Caplan suggested that these two cognitive PIU symptoms "might be useful theoretically, in helping to explain how negative outcomes associated with

Internet use may be linked with one's preference for virtual, rather than face-to-face, relationships" (p. 568).

Thus, it is likely that individuals who prefer online social interaction to FtF interaction also develop the symptoms that constitute PIU. Consequently, the current study sought to test the following hypothesis:

> *Hypothesis 2:* There is a positive relationship among individuals' degree of preference for online social interaction, symptoms of PIU, and negative outcomes resulting from Internet use.

Finally, taken as a whole, the theory proposed here posits that psychosocial well-being is a distal cause of negative outcomes associated with Internet use, and that relationship is mediated by important cognitive and behavioral variables such as preference for online social interaction and the symptoms of PIU described above. Consequently, the current study sought to test one last hypothesis:

> *Hypothesis 3:* Psychosocial well-being is negatively related to harmful outcomes associated with Internet use, but the relationship is mediated by preference for online social interaction and symptoms of PIU.

The following sections report the methods and results of a study that tested the hypotheses presented above.

Methodology

Participants were 386 undergraduate students (270 females and 116 males) who ranged in age from 18 to 57 years old (M = 20; Mdn = 20; SD = 2.22 years).[4,5] About half of the participants were recruited from an introductory communication course, where they received extra credit for their participation. These participants were offered additional credit if they brought a second person from outside of the class to participate. Almost every participant brought a second student from outside of the class to the lab to participate in the study. Students from outside of the class constituted about half of the sample.

Variables and Measures

Preference for online social interaction, PIU, and negative outcomes due to Internet use. The Generalized Problematic Internet Use Scale (GPIUS) (Caplan, 2002) is a self-report measure assessing the prevalence of cognitive

and behavioral symptoms of PIU along with the degree to which an individual's Internet use results in negative personal, academic, or professional outcomes. Participants' endorsement of each statement is measured by asking them to rate the extent to which they agree or disagree with the item on a Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), where strength of agreement indicates the intensity of the PIU cognition, behavior, or outcome represented by a scale item.

The GPIUS consists of seven subscales measuring different dimensions, or symptoms, of PIU along with a subscale that measures negative outcomes due to Internet use. Specifically, the GPIUS subscales include the following: (a) Mood Alteration (the extent to which an individual uses the Internet to facilitate some change in negative affective states); (b) Perceived Social Benefits (the extent to which an individual perceives Internet use as entailing greater social benefits than face-to-face communication); (c) Perceived Social Control (the extent to which an individual perceives increased social control when interacting with others online); (d) Withdrawal (the degree of difficulty staying away from the Internet); (e) Compulsivity (the inability to control, reduce, or stop online behavior, along with feelings of guilt about time spent online); (f) Excessive Internet Use (the degree to which an individual feels that he or she spends an excessive amount of time online or even loses track of time when using the Internet); and (g) Negative Outcomes (the severity of personal, social, and professional problems resulting from one's Internet use).

For the current study, two of the GPIUS subscales were employed to operationalize preference for online social interaction. The two GPIUS subscales tapping Perceived Social Benefit and Perceived Social Control reflect the character of the preference for online social interaction construct introduced in the current article. Specifically, these two subscales may be manifestations of a broader underlying dimension reflecting a preference for online social interaction. An examination of the correlation between Perceived Social Control and Perceived Social Benefits revealed a robust association between the two, $r = .54$, $p < .01$. Second, items from both of these subscales were submitted together to a reliability analysis that indicated a high degree of internal consistency among the two subscales, $\alpha = .84$.

Thus, for the current study, items from these two subscales were combined to create a measure of preference for online social interaction. Next, to enhance the face validity of this modified measure, additional items that were not retained in Caplan's (2002) original analysis were added, including: "I am willing to give up some of my face-to-face relationships to have more time for my online relationships," "My relationships online are more important to me than many of my face-to-face relationships," and "I am happier being online than I am offline." Finally, one of the original GPIUS items,

"When I am online, I socialize with other people without worrying about how I look," was dropped to further enhance the reliability.[6] These new items, along with the items from the two subscales described above, were submitted to a second reliability analysis. The result indicated that the items from both subscales, along with the new items listed above, had a high degree of internal consistency, $\alpha = .86$. Together, these items were used to assess participants' degree of preference for online social interaction. The other GPIUS subscales also yielded high reliability scores ranging from $\alpha = .80$ to .85. The intercorrelations among the preference for online social interaction measure and other GPIUS subscales appear in Table 2.

Measures of psychosocial well-being. Two measures were included to operationalize psychosocial well-being, both of which are commonly used in the social sciences because of their high validity and reliability. Psychosocial well-being variables of interest included loneliness and depression. Depression was measured with the Beck Depression Inventory-II (Beck, Steer, & Brown, 1996; in current study, Cronbach's $\alpha = .90$) and loneliness was measured with the UCLA Loneliness scale (Russell, Peplau, & Cutrona, 1980; in current study, Cronbach's $\alpha = .86$).

Results

Hypothesis 1

Hypothesis 1 predicted positive associations among preference for online social interaction, depression, and loneliness whereby individuals' levels of depression and loneliness would predict their level of preference for online social interaction. To test this hypothesis, a multiple regression procedure was performed with preference for online social interaction entered as the dependent variable, and both depression and loneliness entered simultaneously on the first step as predictors. As predicted, both depression, $\beta = .31, t = 5.75, p < .001$, and loneliness, $\beta = .19, t = 3.46, p < .001$, were significant predictors of preference for online social interaction. Together, loneliness and depression accounted for 19% of the variance in preference for online social interaction scores, $R^2 = .19, F(2, 383) = 45.49, p < .001$. Thus, Hypothesis 1 was supported.

Hypothesis 2

Hypothesis 2 posited that level of preference for online social interaction would predict the severity of symptoms of PIU and negative outcomes due to

Internet use. This hypothesis was tested with a MANOVA procedure. For the MANOVA procedure, preference for online social interaction was entered as an independent variable, and excessive use, compulsive use, withdrawal, mood alteration, and negative outcomes were entered as dependent variables. Results from the MANOVA demonstrated that preference for online social interaction was a significant predictor of the linear combination of the dependent variables, $\lambda = .59$, $F(5, 380) = 52.04$, $p < .001$, partial $\varepsilon^2 = .41$, observed power = 1.00. The MANOVA also yielded significant between-subjects effects and parameter estimates for preference for online social interaction on each of the dependent variables. Specifically, preference for online social interaction accounted for 35% of variance in mood alteration, $\beta = .90, t = 14.44, p < .001, R^2 = .35$, observed power = 1.00; 21% of variance in compulsive use, $\beta = .60, t = 10.51, p < .001, R^2 = .21$, observed power = 1.00; 19% of variance in withdrawal symptoms, $\beta = .60, t = 9.35, p < .001, R^2 = .19$, observed power = 1.00; 17% of variance in negative outcomes, $\beta = .40, t = 8.92, p < .001$, $R^2 = .17$, observed power = 1.00; and 14% of variance in excessive use, $\beta = .71$, $t = 7.87$, $p < .001$, $R^2 = .14$, observed power = 1.00. Thus, as predicted by Hypothesis 2, preference for online social interaction predicted participants' scores on the symptoms of PIU along with negative outcomes.

Hypothesis 3

Hypothesis 3 predicted that an individual's level of psychosocial well-being would predict negative outcomes associated with Internet use, but that this relationship will be mediated by preference for online social interaction and symptoms of PIU (i.e., excessive use, compulsive use, withdrawal, and mood alternation). A series of regression analyses were employed to determine the extent to which variance explained in the dependent variable by the target predictors was due to the proposed mediators (Baron & Kenny, 1986; Judd & Kenny, 1981).

In the first regression equation, the target predictors (i.e., loneliness and depression) were entered alone on the first step to determine the variance they explained; this variance may contain components that are (a) mediated by some other variable (here, preference for online social interaction and the symptoms of PIU) and (b) unique to the target predictors (i.e., direct or unmediated by any other variables). At the next step, the proposed mediators (i.e., preference for online social interaction and symptoms of PIU) were entered into the equation; at this point, any increment in the variance explained was necessarily due to the unique (i.e., residual) effects of the proposed mediators. In a second regression equation, the order of entry for the predictors was reversed; the mediators were entered at the first step and the target

Table 1
Zero-Order Pearson Correlations Among Generalized Problematic Internet Use Subscales, Depression, and Loneliness

	1	2	3	4	5	6
1. Negative Outcomes	1					
2. Excessive Use	.172**	1				
3. Mood Alteration	.372***	.517***	1			
4. Compulsive Use	.430***	.406***	.623***	1		
5. Preference for Online Social Interaction	.414***	.373***	.593***	.460***	1	
6. Depression	.192***	.230***	.302***	.215***	.408***	1
7. Loneliness	.243***	.112*	.252***	.158**	.350***	.525***

*$p < .05$. **$p < .01$. ***$p < .001$.

predictors were entered second. Entering the mediators at the first step determined the variance in the dependent variable that they explained, both uniquely and in conjunction with the target predictors. The target predictors were entered on the second step, and any increment in explained variance represented the direct (i.e., unmediated) effects of those predictors on the dependent variable.[7] A zero-order Pearson correlation analysis demonstrated that all key variables met the necessary assumptions for testing the mediated model (see Table 1).

A comparison of the two competing regression equations (see Table 2) supports Hypothesis 3. These regressions indicated that loneliness, $\beta = .20$, $t = 3.40$, $p < .05$, by itself accounted for 7% of the variance in negative outcomes, $R^2 = .07$, $F(2, 383) = 13.29$, $p < .001$, and that depression was not a significant predictor, $\beta = .09$, $t = 1.52$, $p = .13$. However, as expected, when the influence of preference for online social interaction, $\beta = .22$, $t = 3.76$, $p < .001$, excessive use, $\beta = -.14$, $t = 2.65$, $p < .01$, mood alteration, $\beta = .03$, $t = .37$, $p = .71$, withdrawal, $\beta = .23$, $t = 3.94$, $p < .001$, and compulsive use, $\beta = .23$, $t = 3.98$, $p < .001$, were included on the second step, the psychosocial variables only accounted for 1% of variance in negative outcomes. On their own, the preference for online social interaction and PIU symptoms accounted for 28% of the variance in negative outcomes, $R^2 = .28$, $F(5, 380) = 29.34$, $p < .001$.

All but one of the significant predictor variables, excessive use, had a positive relationship with negative outcomes. There was a significant positive correlation between excessive use and negative outcomes, yet the regression analysis identified a significant negative association. Although beyond the purview of the current study, this pattern of results typically indicates the presence of a suppressor variable (Cohen & Cohen, 1983; Conger, 1974; Krus & Wilkinson, 1986).[8] For the purposes of the current study, the noteworthy finding here is that excessive use was one of the weakest predictors of

negative outcomes, whereas preference for online social interaction, compulsive use, and withdrawal were among the strongest. Specifically, the current data suggest that compulsive Internet use is a much stronger predictor of negative outcomes than excessive Internet use.

Overall, loneliness and depression did not have large independent effects on negative outcomes, although the positive effect was significant (this may have been due to the large sample size); they independently accounted for only 1% of variation in negative outcome scores (controlling for the mediating variables). On the other hand, preference for online social interaction, along with the other PIU symptoms (except for mood alteration), had relatively larger significant independent effects on negative outcomes, accounting for 23% of variance in negative outcomes (controlling for depression and loneliness). Thus, consistent with Hypothesis 3, the mediation analysis supports the predicted indirect influence of loneliness on negative outcomes associated with Internet use, and that this influence was mediated by preference for online social interaction and other PIU symptoms. Inconsistent with Hypothesis 3, however, depression was not a significant indirect, or direct, predictor of negative outcomes.

Discussion

The current study set out to empirically examine the associations among individuals' preference for online social interaction, their psychosocial health, and symptoms of PIU. According to the theory presented at the outset, individuals who suffer from various forms of psychosocial distress are more likely to develop a preference for online social interaction (especially the synchronous contexts) than healthier people because they perceive it to be less threatening and more rewarding than ordinary FtF interaction. Yet, over time, people who prefer online social interaction may engage in compulsive and excessive use of some synchronous CMC applications to the point that they suffer negative outcomes at home and at work, further exacerbating existing psychosocial problems.

The results reported above support the proposition that preference for online socialization is a key contributor to the development of problematic Internet use. Moreover, the theory asserts that the relationship between psychosocial health and PIU is mediated by preference for online socialization. The current study tested two specific hypotheses regarding whether one's preference for online, rather than FtF, social interaction is related to other various facets of one's psychosocial well-being and PIU. First, with regard to Hypothesis 1, the results suggest a significant relationship between psychosocial health and preference for online social interaction; individuals'

Table 2
Hierarchical Regression Equations Predicting Negative Outcomes of Internet Use

	Step	Variables Entered	β	*t*	R^2 Change	*F* Change	*df*	R^2 Total	*F* Total	*df*
Equation 1	1	Depression	.09	1.52	.07	13.29	2,383***	.07	13.29	2,383***
		Loneliness	.20	3.40***						
	2	Depression	–.04	–0.75	.23	24.08	5,378***	.29	22.14	7,378***
		Loneliness	.13	2.52*						
		Compulsive use	.23	3.98***						
		Mood alteration	.03	0.37						
		Preference for online socialization	.22	3.76***						
		Excessive use	–.14	–2.65**						
		Withdrawal	.23	3.94***						
Equation 2	1	Compulsive use	.23	3.90***	.28	29.34	5,380***	.28	29.34	5,380***
		Mood alteration	.04	0.56						
		Preference for online social interaction	.25	4.5***						
		Excessive use	–.15	–2.79**						
		Withdrawal	.23	3.84***						
	2	Depression	–.04	–0.75	.01	3.27	2,378*	.29	22.14	7,378***
		Loneliness	.13	2.52*						
		Compulsive use	.23	3.98***						
		Mood alteration	.03	0.373						
		Preference for online social interaction	.22	3.76***						
		Excessive use	–.14	–2.65**						
		Withdrawal	.23	3.94***						

*$p < .05$. **$p < .01$. ***$p < .001$.

levels of depression and loneliness predicted their level of preference for online social interaction. Together, loneliness and depression accounted for 19% of the variance in level of preference for online social interaction. Although there was a great deal of variance left unaccounted for by the psychosocial health predictors, the results offer initial support for one central aspect of the theory presented above. With regard to explaining the remaining variance in preference for online social interaction scores, the theory outlined at the beginning of the article suggests additional predictor variables. For example, perceived social skill, which was not included in the current study, may have added more explained variance by mediating the association between psychosocial health and preference for online social interaction. In addition, there may be other personality variables that play a role here (e.g., self-monitoring, extroversion, communication apprehension). Future studies can help advance the current theory by including these variables in their designs.

Second, the results reported above support Hypothesis 2, which predicted a positive relationship between individuals' degree of preference for online social interaction and symptoms of PIU. A MANOVA revealed both significant multivariate and univariate relationships whereby preference for online social interaction predicted levels of PIU symptoms and their negative consequences. In fact, at the multivariate level, preference for online social interaction accounted for 41% of the variance in the linear combination of PIU symptoms. With regard to the univariate results, R^2 values among the PIU symptoms and negative outcomes, all were significant, indicating that preference for online social interaction accounted for between 14% to 31% of variance in these variables. These results support the theory advanced earlier, which proposed that preference for online social interaction predisposes individuals to develop other symptoms of PIU. Yet, future research involving longitudinal design and structural equation modeling techniques is necessary to shed further light on the directions of the proposed causal paths outlined at the beginning of this article.

Third, the results of the mediation analysis supported the hypothesized (Hypothesis 3) mediating influence of preference for online socialization and PIU on the relationships between psychosocial health and negative outcomes of Internet. Given the exploratory nature of the current study (i.e., a first attempt at testing key elements of a new theory), the results offer initial support for the general claims outlined in the theory presented earlier. Overall, the predictors, both direct and indirect, accounted for approximately 29% of the variance in Internet-related personal and professional negative outcomes.

In addition, two unexpected results are noteworthy. First, although loneliness played a significant role in the development of problematic Internet use, depression had little influence on the process. One explanation for these results is that loneliness is theoretically more salient of a predictor of preference for online social interaction because the types of negative perceptions about communication competence are more pronounced among lonely people. On the other hand, depression can arise from a wide array of circumstances, many of which are not related to one's social life (i.e., traumatic experience, work-related stress, physical illness, poverty, etc.) and therefore may have less of an influence on one's perceptions of one's social skills. Of course, this is an empirical question that requires additional research that includes measures of perceived social skill and other beliefs about interpersonal communication.

A second unexpected result was the lack of influence of using the Internet for mood alteration on negative outcomes. One possible explanation for this is that there may be a wide variety of circumstances, aside from interpersonal CMC, in which one uses the Internet to alter one's affective state. For example, game-playing is enjoyable and exciting, reading for leisure is relaxing, viewing online art may be soothing or stimulating, and so forth. Thus, in and of itself, using the Internet for mood-altering purposes may not necessarily lead to the negative outcomes associated with preference for online social interaction, excessive and compulsive use, and experiencing psychological withdrawal.

Limitations and Future Directions

The current study represents an initial step toward developing and testing a new theory. As such, the goal here was to support the most basic, or fundamental, aspects of the theory. Theory building takes time and research that builds on preliminary work. Consequently, a number of limitations of the current study are worth addressing to recommend directions for future research.

First, the second major argument outlined earlier in the article proposed that a number of characteristics that distinguish synchronous CMC and FtF interaction may be especially appealing to individuals who feel inhibited or perceive themselves to lack competence in traditional social settings. Some of these communicative features include greater anonymity, lower inhibitions, controlled self-presentation, lower interpersonal risks (e.g., face loss), and increased confidence. The current study did not employ methods that would be necessary to isolate and test whether each of these are, in fact, causal mechanisms that lead individuals to prefer online social interaction. Yet, the

data did confirm the predicted causal relations proposed in the beginning of this article. Solid empirical evidence pertaining to causality is certainly an important issue that future research needs to address. Perhaps the inclusion of other potential variables will increase the explanatory power of the model proposed here (approximately 70% of variance in negative outcome scores was unaccounted for by the current set of predictor variables).

A second limitation involves the sample used in the current study. Specifically, the current sample did not exhibit very high degrees of problematic Internet use. The median preference for online social interaction was 1.28 on a scale ranging from 1 to 5; most participants did not prefer online social interaction over FtF interaction. Again, although the findings reported above represent an important step toward a better understanding of PIU and its relationship to interpersonal communication, further research is necessary to help shed light on some of these issues.

Third, despite the current theory's emphasis on perceived social competence, the model does not currently consider the role that individuals' actual social skill or communicative competence plays in the development of PIU. Moreover, the current study employed previous work in other areas of interpersonal communication research to support the claim that perceptions of poor social competence lead lonely and depressed people to seek an alternative channel for interpersonal activity. Future studies should include measures of communication apprehension (McCroskey, 1978), unwillingness to communicate (Burgoon, 1976), and measures of social skill (Riggio, 1989) to empirically assess the proposed associations among attitudes about interpersonal communication competence, psychosocial health, and PIU. Studies that employ such variables would further enhance our understanding of how individual differences in the realm of perceptions about interpersonal skill and in their actual levels of communicative competence predispose people to develop PIU. As researchers from a variety of disciplines continue to explore each other's theoretical and empirical literatures, our understanding of PIU will continue to develop—hopefully to the point that we can eventually find ways to identify and help individuals that currently suffer, or who are at risk from suffering, from unhealthy and problematic Internet use.

Notes

1. The author wishes to thank an anonymous reviewer for this observation.
2. The usage of the term *problematic* here differs from terms that have been used in previous literature such as *Internet addiction* or *pathological Internet use*. The author wishes to thank an anonymous reviewer for suggesting this aspect of the term *problematic*.

3. The Internet offers both synchronous and asynchronous forms of CMC. Synchronous CMC happens in real time, requires the copresence of all participants, and bears a closer resemblance to traditional face-to-face (FtF) interaction than asynchronous computer-mediated communication (CMC). For example, social interaction in chat rooms or on instant messaging (IM) happens in real time, requires some adherence to turn-taking (albeit less than is required for FtF interaction), requires both participants to be present during the communicative exchange, and demands participants' allocation of both time and attention to the interactive process. Examples of popular synchronous CMC applications include chat rooms, IM, online interactive games, and other online environments in which two or more people interact with each other in real time (for more detailed descriptions of these technologies and virtual environments, see Curtis, 1997; Haythornwaite, Wellman, & Garton, 1998; Parks & Roberts, 1998; Turkle, 1995; Wallace, 1999; Werry, 1996). On the other hand, asynchronous CMC usually involves an exchange of messages over a more extended period of time, where it is not necessary for both participants to be present, is less bound by turn-taking rules, requires considerably less coordination among interactants, and is more similar in character to letter writing than to FtF interaction. Examples of popular asynchronous CMC activities include e-mail and participating in newsgroups (where one can read and post messages on a given topic).

4. Some of the data used for analyses have been reported in an earlier publication (Caplan, 2002). However, the analyses reported here were not included in that report. The current study used Caplan's (2002) Generalized Problematic Internet Use Scale (GPIUS) subscales to develop a measure for preference for online social interaction. In addition, the analyses reported here tested relationships among preference for online socialization and indicators of loneliness, depression, problematic Internet use (PIU) symptoms, and negative outcomes due to Internet use.

5. Aside from convenience, there is also a methodological reason for the use of college student participants in the current study. The theory developed in the current article pertains to individuals who have regular access to the Internet and use it on a regular basis. The participants in the current study attend a university that relies heavily on Internet activity for social, professional, and academic purposes. Each dorm room has an Ethernet connection and most buildings on campus have public computer laboratories. Thus, the sample consisted of people who are active Internet users. In addition, the theory outlined in the current article pertains to social-psychological and behavioral phenomena that should hold across any group of people who frequently use the Internet. In other words, the effects of loneliness, depression, and low self-esteem should not be significantly any different than those among nonstudents with similar levels of Internet use. The fact that the participants in the current study use the Internet on a regular basis minimized the number of people in the sample that do not have experience or exposure to the Internet.

6. Although the addition of a scale item that clearly stated "I prefer online social interaction over face-to-face interaction" would have enhanced face validity, the current analysis was limited to data from scale items that were originally collected for an earlier study (Caplan, 2002).

7. If the hypothesized mediated model is supported (i.e., if preference for online social interaction and the symptoms of PIU do mediate the effects of psychosocial health on negative outcomes), then the amount of variance that the target predictor explains at the point it is entered in the second equation (when it was entered second) will be substantially smaller than in the first equation (when it was entered first). Moreover, subtracting the R^2 change for depression and loneliness in the second equation from the R^2 change for depression and loneliness in the first equation identifies the amount of variance in negative outcomes due to psychosocial health that is specifically mediated by preference for online social interaction and symptoms of PIU. If preference

for online social interaction and symptoms of PIU do fully mediate the effects of psychosocial well-being on negative outcomes due to Internet use, then the addition of depression and loneliness at the second step of the second equation should not result in a significant increase in explained variance. If preference for online social interaction and symptoms of PIU partially mediate this influence, then the addition of psychosocial variables at the second step in the second equation will result in a statistically significant increase in explained variance. However, this increment should be substantially smaller than that obtained when psychosocial variables are entered at the first step of the first equation. If preference for online social interaction and symptoms of PIU do not have any mediating influence on the effects of psychosocial health on negative outcomes of Internet use, then the increment in explained variance due to depression and loneliness should be essentially the same in Equation 1 (when loneliness and depression were entered first) and Equation 2 (when they are entered second).

8. As Cohen and Cohen (1983) explained, "the term suppression can be understood to indicate that the relationship between the independent or causal variables is hiding or suppressing their real relationships with *Y*, which would be larger or possible of opposite sign were they not correlated" (p. 95).

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