Chapter 3

Social Networking
Addictive, Compulsive, Problematic, or Just Another Media Habit? 1

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Social networking services have become a highly popular online activity in recent years with 75% of young adults online, aged 18 to 24, reporting that they have a profile (Lenhart, 2009). Social network sites have become such an obsession with some that they raise concerns about the potential harmful effects of their repeated use, known in the popular press as “Facebook addiction” (Cohen, 2009). For many Internet users, social networking has perhaps indeed become a media habit, defined (after LaRose, 2010; Verplanken & Wood, 2006) as a form of automaticity in media consumption that develops as people repeat media consumption behavior in stable circumstances. How might repeated social networking evolve from a “good” habit that merely indulges a personal media preference into a “bad” habit with potentially harmful life consequences that might rightfully be termed compulsive, problematic, pathological, or addictive? And, is social networking any more or less problematic than other popular Internet activities?

Although the extent of Internet pathology by any name, and indeed its very existence, are open to question (Shaffer, Hall, & Vander Bilt, 2000; Widyanto & Griffiths, 2007), the attention of scholars continues to be drawn to the harmful effects of excessive Internet consumption. In a national survey, 6% of U.S. adults said a relationship had suffered as a result of their Internet use (Aboujaoude, Koran, Gamel, Large, & Serpe, 2006). Correlational studies have linked Internet use and psycho-social maladjustment (e.g., Caplan, 2007; LaRose, Lin, & Eastin, 2003; McKenna & Bargh, 2000; Morahan-Martin & Schumacher, 2000; Young & Rogers, 1998). Internet usage disorder has been proposed as a new category of mental illness (Block, 2008), including a subcategory of email/text messaging that might subsume social networking.

Whether social networking habits are especially problematic or not, they are a distinctive media consumption phenomenon that harkens back to previous studies of television addictions (Kubey & Csikszentmihalyi, 2002). An understanding of Internet habits can extend models of media behavior to
incorporate habitual, automatic consumption patterns as well as those that result from active selection processes (LaRose & Eastin, 2004). The current premise is that problematic media behaviors are habits that have gotten out of control (cf. Marlatt, Baer, Donovan, & Kivlahan, 1988) and that they begin as media favorites, defined here as the preferred media activity within a particular medium. Media favorites are themselves habits, as evident when items now recognized as indicators of habit strength (e.g., watching “because it is there” and because “it is part of a daily ritual”) entered into a factor analysis of the uses and gratifications of favorite TV program types (Bantz, 1982). Verplanken and Orbell (2003) found that media consumption was highly correlated to habit strength while Wood, Quinn, and Kashy (2002) reported that over half of all media behaviors recorded in an experience sampling study were habit-driven. Yet clearly not all media habits spin out of control to become problematic, so how might we explain why some do and others do not? And is social networking one of the habits that is especially likely to do so?

Two competing explanations of problematic media habits have emerged in the communication literature: a social skill account that explains Problematic Internet Use (PIU) as compensation for social incompetence in the offline world (Caplan, 2005) and a socio-cognitive model of unregulated media use (LaRose et al., 2003). The present research comparatively evaluates and then integrates these two perspectives. To arrive at an understanding of social networking habits and their potential for abuse, we will first integrate the two perspectives.

The Social Skill Model of PIU

Caplan (2005, p. 721) defined PIU as a “multidimensional syndrome consisting of cognitive and behavioral symptoms that result in negative social, academic or professional consequences.” Building on Davis’ (2001) description of pathological Internet use in relation to symptoms of impulse control disorders, and on other researchers who drew upon symptoms of pathological gambling and substance abuse, Caplan (2002) developed a multidimensional measure of PIU dimensions. They were mood alteration, social benefits, negative outcomes, compulsivity, excessive time, preoccupation, and interpersonal control.

Predicated on repeated observations that negative life consequences are especially associated with social uses of the Internet, the social skill model posits that compulsive Internet use is the direct result of preference for online social interaction (“social benefits” in the earlier factor analysis), which in turn is inversely related to self-presentational skills (previously dubbed “interpersonal control”). Compulsive use was the causal antecedent of negative
outcomes of Internet use, such as missing social engagements. Thus, the social skill account explained PIU as a form of compensation for defective real-world social skills. This model was a moderately good fit, accounting for 10% of the variance in negative outcomes (Caplan, 2005).

The resulting social skill model omitted three dimensions of PIU (Caplan, 2003): mood alteration, excessive time, and withdrawal. These additional variables can be interpreted within the competing socio-cognitive model.

The Socio-Cognitive Model of Unregulated Internet Use

In the socio-cognitive model of unregulated Internet use (LaRose et al., 2003), expected outcomes are key determinants of media behavior. So, for example, the expectation that social networking will relieve loneliness should predict social networking use. This corresponds to the “mood alteration” dimension of PIU. Internet usage is also determined by self-efficacy, or belief in one’s capability to organize and execute a particular course of action, such as the person’s perceived ability to use social networking to make new friends.

The socio-cognitive self-regulatory mechanism describes how humans exercise—but also how they may lose—control over media behavior. Deficient self-regulation is defined as a state in which self-regulatory processes become impaired and self-control over media use is diminished (LaRose et al., 2003). In the model of unregulated Internet use, overall Internet usage was a function of self-reactive outcome expectations and self-efficacy. Usage was further predicted by two dimensions of deficient self-regulation, one of which was associated with lack of awareness and attention and a second that was associated with lack of controllability and intentionality. The latter was causally related to the former and was itself predicted in turn by self-reactive outcome expectations and self-efficacy. Self-efficacy was also causally related to self-reactive outcome expectations and to the controllability/intentionality variable.

New Perspectives of Habitual Behavior

Deficient self-regulation aligns with conceptions of habit found in current research in social psychology (e.g., Verplanken & Orbell, 2003; Wood & Neal, 2007) that define habits as a form of automaticity, which in turn is thought to have four facets: lack of awareness, lack of attention, lack of controllability, and lack of intentionality. The dimensions underlying the construct are unclear, however. Verplanken and Orbell (2003) arrived at a
unidimensional solution that incorporated three of the four facets of automaticity. LaRose et al. (2003) empirically derived two dimensions that incorporated all four, as described above. Caplan’s (2002) compulsive use dimension reflected a lack of controllability (“Unsuccessful attempts to control use”) while his withdrawal dimension had items that Verplanken and Orbell (2003) identified with inattention (“Miss being online if I can’t go on it”) and the excessive time dimension betrayed a lack of intentionality (“Go online for longer time than I intended”).

Recent developments in the neurology and social psychology of automaticity call for a conceptual re-assessment. On a neurological level, repeated behaviors gradually shift from conscious cortical control to automated responses governed by the basal ganglia, a group of nuclei in the cerebrum (Yin & Knowlton, 2006). Thus, consciously framed reasons for Internet use, such as Caplan’s mood alteration dimension, are distinguishable from habit. The four facets of automaticity are independent in that they can be manipulated separately (Saling & Phillips, 2007) so the differing number of dimensions may reflect varying combinations among the four dimensions of automaticity that are found across behaviors (Saling & Phillips, 2007).

Caplan’s (2002) dimensions of compulsive use, excessive time, and withdrawal included items that correspond to lack of controllability, intentionality, and attention, respectively, but a dimension indicating lack of awareness was not found.

The socio-cognitive concept of self-regulation incorporates all four facets of automaticity, and these can be re-framed in terms of sub-processes of the self-regulatory mechanism (Bandura, 1986). Here, deficient self-regulation is abandoned in favor of habit as an umbrella concept describing the overall weakness of self-regulation that encompasses two sub-processes associated with habits. Habit formation is in part a deficiency in self-observation. As behavior is repeated, individuals become less attentive to the immediate consequences of its performance and rely on cognitive shortcuts to prompt behavior, such as environmental cues or internal mood states, rather than consciously considering the behavior on each successive occurrence. This conserves scarce attentional resources, freeing the individual to process new information while placing repeated choices “on automatic,” below the level of conscious awareness. Habits are maintained through a failure of self-reaction, the mechanism through which individuals apply their own incentives to modify their behavior and its outcomes, such as administering rewards for moderate behavior or indulging feelings of guilt for excessive media behavior. In the absence of such corrective measures, deficient self-reaction also diminishes attentiveness to behavior and therefore contributes to deficient self-observation.
An Integrated Model of Internet Habits

The socio-cognitive model of unregulated Internet use therefore incorporates dimensions of PIU not found in the social skill account of the syndrome. The mood alteration dimension of PIU (Caplan, 2002) corresponds to self-reactive outcome expectations, withdrawal is related to deficient self-observation, and excessive use is located in deficient self-reaction along with compulsivity. The socio-cognitive model of unregulated Internet use described above arrays these in a causal model suggested by a well-established theory of human behavior. Both models may now be understood to explain habitual Internet behavior, one focusing on the amount of consumption and the other on its consequences.

Comparing the two, the social skill account identifies negative life outcomes as a separate, dependent variable. Since such outcomes are a necessary condition for the diagnosis of impulse control disorders (Shaffer et al., 2000), this is an important addition. Three changes in terminology will help to further integrate the two models: Compulsive use is re-labeled deficient self-reaction to be consistent with the social cognitive model. Negative outcomes from Caplan’s model are designated as negative life consequences to avoid confusion with outcome expectations in the SCT model. Finally, the antecedent variable of the social skill account is re-labeled deficient social skill to reflect the wording of its operational definition and clarify its conceptual relationship to preference for online social interaction.

Substituting negative life consequences for overall Internet usage as the dependent variable produces a socio-cognitive model of PIU shown in Figure 3.1. The rationale is the time inelasticity hypothesis (Nie, 2001) that holds that time spent on the Internet subtracts from the time available for other activities. Consistent with this view, an excessive time factor had a significant and positive zero-order correlation with negative outcomes (Caplan, 2003) and the operational definition of the latter asks about harm to other activities that result from Internet use. The substitution of negative consequences for Internet usage, rather than its addition to the previous LaRose et al. (2003) model, is to achieve parsimony; otherwise, the Social Cognitive model of PIU would include links to negative consequences not only from usage but also from the other variables related to usage in the original model. Also for parsimony’s sake, self-efficacy can be deleted on the assumption that sufficient levels of self-efficacy are achieved in the process of elevating an activity to a favorite so that the former becomes inoperative as a predictor of usage and hence of the negative life consequences that might follow.

**H1:** Negative life consequences of favorite Internet activities are explained by depression, self-reactive outcome expectations, deficient self-observation, and deficient self-reaction.
This model provides an alternative explanation of negative life consequences from the social skills account. Depression causes a negative cognitive bias through which individuals slight their own successes at maintaining self-control and blame themselves for failure (Bandura, 1991), thus undermining effective self-reaction. Dysphoric moods also stimulate the seeking of self-reactive outcomes (or “mood alteration” in Caplan, 2002) to dispel those moods (see also Zillmann & Bryant, 1985). Repeated efforts to obtain self-reactive outcomes cause deficient self-observation as behavioral control shifts to non-conscious processes governed by the basal ganglia (Yin & Knowlton, 2006). Self-observation is also weakened by deficient self-reaction as individuals abandon attempts to regulate their Internet behavior, making it less subject to conscious internal scrutiny. The conscious pursuit of favorite activities to cheer oneself up or to relieve loneliness causes mounting use, the socio-cognitive version of the classic “active media selection” hypothesis of uses and gratifications research (LaRose & Eastin, 2004). Deficient self-reaction and deficient self-observation also lead to mounting use as self-regulation fails and habit strength increases. Finally, the time allocated to favorite activities interferes with important activities, producing negative life consequences.

The social skill model can be incorporated by adding deficient social skills and preference for online interaction as antecedent variables to deficient self-
reaction. Depression causes deficient social skills by impairing interpersonal communication and inviting rejection (Segrin & Abramson, 1994). Also, a preference for online social interaction would likely result from successful efforts to relieve dysphoric moods through online interactions. Thus, self-reactive outcome expectations should cause a preference for online social interaction (Figure 3.2).

**H2:** Depression will be positively related to deficient social skill.

**H3:** Self-reactive outcome expectations will be positively related to preference for online social interaction.

**Is Social Networking More Problematic Than Other Online Activities?**

A wide variety of online activities have been identified as “addictive” (Block, 2008) and, although social networking is not currently among them, it is perhaps only a function of the relative newness of the activity. However, the appropriateness of the term “addictive” and related constructions, including
compulsive, pathological, and problematic, are themselves problematic in that there appear to be so few truly addictive/compulsive/pathological/problematic users included in such research that they are more properly considered studies of online media habits in normal populations. That is because the criteria used to assess pathology, by whatever name, are based on self-reported responses to interval level scales with the average levels of endorsement typically at or below the midpoint of the scales among the general student populations that are typical of this stream of research. And, self-reports of symptoms (e.g., agreeing that family relationships have been damaged as a result of social networking based on one or two instances of being late for dinner) are lax compared to the assessments of trained clinicians. Also, the self-reported symptoms fail to rule out other psychiatric conditions (e.g., mania, impulse control disorders, pathological gambling, sexual compulsions) that may explain the behavior in question. Using rigorous criteria that would attribute pathology only to those who strongly agree that they have suffered significant life consequences as a result of Internet use, it can be estimated that potentially problematic or addictive cases constitute something in the order of 1% to 5% of college student populations (e.g., Caplan, 2005; Dowling & Quirk, 2009), a handful of possible cases among the hundreds included in such surveys. As yet, there appears to be no research that offers a comparative analysis of the “addictiveness” of social networking in relation to other popular online pursuits.

If those were not truly studies of Internet addiction, then perhaps they were studies of Internet habits. The criteria used were drawn from the same sources, namely, the DSM IV criteria for pathological gambling and impulse control disorders (American Psychiatric Association, 1994) as measures of deficient self-regulation, and most of the items used in the operational definitions also match items from a validated measure of habits (the SRHI, Verplanken & Orbell, 2003).

There has been previous research of social networking habits, although not conducted under that rubric. Facebook Intensity (Ellison, Steinfield, & Lampe, 2007) was operationally defined (no conceptual definition was provided) by the number of Facebook friends, the amount of time spent on Facebook in a typical day, and several Likert-type questions that arguably included items tapping deficient self-observation (“Facebook has become part of my daily routine” and “Facebook is part of my everyday activity”) and of deficient self-reaction (“I feel out of touch when I haven’t logged onto Facebook for a while”). The average scores on the indicators of deficient self-observation were near the midpoints of the scales, indicating a moderate degree of habit formation. Internet uses (Bessiere, Kiesler, Kraut, & Boneva, 2008) conform to an often-used (if flawed, see LaRose, 2010) measure of Internet habits in that
they ask respondents to indicate the frequency of past behavior. The “communicating with family and friends” and “communicating to meet people” dimensions thus can be construed to represent habitual use of online social networking. These were relatively weak habits, averaging 1–2 days a week for family and friends and close to “never” for meeting new people, although it should be noted that these data were collected before social networking services were established. Still, it is interesting to note that communication with family and friends was indulged more frequently than information or entertainment habits. Also, the communication habits were moderately to highly correlated (0.60–0.54) with entertainment/escape uses, the latter being possible indicators of the pursuit of self-reactive outcomes in the present account. However, neither study offered unambiguous comparisons of the habit-forming potential of social networking compared to other online activities.

Consistent with the social skill account, a preference for online social interaction should logically play a more important role in activities that focus on social interaction, such as social networking and messaging, than those in which social interaction is more peripheral, such as downloading media files, online shopping, and online games. That is because the most natural way of making up for social deficiencies in the offline world and expressing a preference for online social interaction would seem to be participation in online socializing. Both the absolute level of the preference for online social interaction and the magnitude of its relationship to deficient self-reaction (called “compulsive use” in the original social skills account of Caplan, 2005) should thus be greatest for online social activities. And if compensation for offline social deficiencies is what makes the Internet especially “problematic,” then negative consequences should be more strongly associated with that preference among social activities than for other activities.

**H4:** a. Preference for online social interaction and b. deficient social skills will be greater among those with social activities as favorite Internet activities than for other activities.

**H5:** Social activities will have more negative consequences than for other activities.

**H6:** a. Deficient social skill will be more related to preference for online social interaction and b. in turn it will be more related to deficient self-reaction for social activities than others.
The socio-cognitive model makes no a priori assumptions about which Internet activities are more problematic than others but does suggest a means to identify the ones most likely to lead to problems: activities that become a primary means of relieving dysphoric moods. So, Internet pastimes with high levels of self-reactive outcome expectations and with the strongest relationships between those expectations and the other variables in the model are arguably the most likely to lead to serious life consequences. Thus, the following question might be answered:

RQ1: Which Internet activities are most problematic?

The present research integrates social skill and socio-cognitive perspectives of PIU. By examining social networking in comparison to other online activities, it tests the key assumptions underlying the social skill model and furthers our understanding of potentially harmful Internet habits.

Method

Participants

Students from two Midwestern universities enrolled in introductory communication classes were invited to participate in an online survey for extra credit. To diversify the sample, 134 students were surveyed at random from the on-campus student population at one of the universities (completion rate of 27%). This yielded 635 usable cases; 58% were female and 42% were male, with a median age of 20 (range 18 to 50).

Measures

Each respondent’s favorite leisure activity on the Internet was the frame of reference. Eleven options were pre-listed and 7% listed “other” favorites. The latter included a number of responses that could be matched to the pre-listed categories (e.g., eBay was recoded in the online shopping category). Distinctive “other” responses included “reading,” webcomics, online forums, fantasy sports, news, and browsing/surfing. Since all of the latter involved downloading information from the Internet and were said to be leisure activities, it was decided to group them with the “downloading entertainment” category (24.4% of respondents). Similarly, chat, instant messenger and email were combined into “messaging” (21.1%), online shopping and auctions into “shopping” (2.4%), and online gaming and gambling into “gaming” (10.4%). Social networking accounted for the remaining favorites (41.6%).
To clarify the overlapping operational definitions of habit-related constructs, an exploratory factor analysis was performed on items from LaRose et al.’s (2003) measures of deficient self-regulation, Caplan’s (2002) PIU scale, and the Self-Report Habit Index (SHRI, Verplanken & Orbell, 2003). This yielded three dimensions interpreted to be deficient self-observation (mean = 4.77, sd = 1.37, α = 0.88), deficient self-reaction (mean = 2.77, sd = 1.25, α = 0.87), and negative life consequences (mean = 2.02, sd = 1.25, α = 0.87). Except where noted, seven-point Likert type rating scales were used throughout.

Self-reactive outcome expectations (mean = 4.05, sd = 1.45, α = 0.82) were borrowed from LaRose et al. (2003). Depression was measured by three items from Mirowsky and Ross’ (1992) short version of the CES-D depression scale, scored 1 for rarely or none of the time (less than one day in the last week) to 4 for all of the time (5–7 days) (mean = 1.76, sd = 0.63, α = 0.73). Self-efficacy was measured with three items specific to the focal favorite activity (mean = 4.99, sd = 1.08, α = 0.71). Deficient social skill was represented by two items (mean = 4.71, sd = 1.19, α = 0.62) from the Self-Monitoring Scale (Lennox & Wolfe, 1984). Preference for online social interaction (mean = 3.38, sd = 1.48, α = 0.87), was measured by three items from Caplan (2005). Internet usage was the minutes spent on Internet on a typical weekday and weekend day, transformed by log_{10} (value +1) and added (mean = 3.97, sd = 0.95, α = 0.72).

Data Analysis

Missing data were replaced with mean values for each component item and the items in each scale were averaged. SPSS version 16.0 (SPSS, 2007) was used for item analysis and the analysis of means. To prepare for path analysis, the multi-item indices were trimmed to retain the three to five items with the highest item–total correlations. The AMOS 16.0 (Arbuckle, 2007) structural equation modeling (SEM) program was used to test hypothesized path models. First, the path models previously reported in LaRose et al. (2003) and Caplan (2005) were replicated. Then, the socio-cognitive model of negative life consequences resulting from Internet use, shown in Figure 3.1, was tested. Finally, an integrated model incorporating both the socio-cognitive and social skills components was examined, shown in Figure 3.2.

Multigroup analysis was used to compare path coefficients across favorite activities by imposing cross-group equality constraints. The chi-square of the model with each path coefficient constrained to equality was compared against that of the unconstrained model. If the model fit of the constrained model was significantly worse than that of the unconstrained model, it was concluded that the coefficient
was significantly different across groups (Kline, 1998). Those listing online shopping as their favorite activity were too few to support a separate analysis.

Results

Considering that CFI and NFI indices over 0.90 indicate acceptable fit (Bentler, 1990; Bollen, 1990), while RMSEA values below 0.06 mean a good fit (MacCallum, Brown, & Sugawara, 1996), the socio-cognitive model of unregulated Internet usage (LaRose et al., 2003) was confirmed in these data ($\chi^2 (3) = 0.211$, n.s., NFI $= 0.999$, CFI $= 1.00$, RMSEA $= 0.00$). This model differed from Figure 3.1 in that Internet usage rather than negative life consequences was the ultimate dependent variable and self-efficacy preceded each of the other variables, save for depression. As was expected when examining favorite activities, self-efficacy was a significant predictor of neither Internet usage ($r = 0.03$, n.s.) nor negative life consequences ($r = -0.06$, n.s.), supporting the decision to eliminate self-efficacy to achieve greater parsimony.

The social skill model of PIU (Caplan, 2005) did not fit the current data well ($\chi^2 (3) = 34.7$, $p < 0.001$, NFI $= 0.889$, CFI $= 0.897$, RMSEA $= 0.129$). The modification indices suggested a correlated error term between deficient social skills and compulsive Internet use (deficient self-reaction in the current terminology). This yielded a good fitting model ($\chi^2 (2) = 3.637$, n.s., NFI $= 0.988$, CFI $= 0.995$, RMSEA $= 0.036$), albeit not one explicable through the social skills account.

The socio-cognitive model of PIU (Figure 3.1) was a good fit ($\chi^2 (2) = 2.583$, n.s., NFI $= 0.993$, CFI $= 0.998$, RMSEA $= 0.021$) and explained 33% of the variance in negative life consequences. All of the expected causal links among variables were confirmed with path coefficients significant at the 0.001 level. Depression predicted self-reactive outcome expectations ($\beta = 0.15$) and deficient self-reaction ($\beta = 0.20$). Self-reactive outcome expectations preceded deficient self-reaction ($\beta = 0.18$), deficient self-observation ($\beta = 0.21$), and negative life consequences ($\beta = 0.24$). Deficient self-reaction also preceded deficient self-observation ($\beta = 0.21$) and negative consequences ($\beta = 0.50$). Finally, deficient self-observation also predicted negative consequences ($\beta = -0.13$), but this was an inverse relationship rather than the positive relationship found in the earlier model of unregulated Internet use (LaRose et al., 2003). With this exception, Hypothesis 1 extending the model of unregulated Internet use to a model of PIU was confirmed.

Adding two variables suggested by the social skills account resulted in an acceptable fit ($\chi^2 (9) = 41.546$, $p < 0.001$, NFI $= 0.923$, CFI $= 0.937$, RMSEA $= 0.076$), although a previous model was a significantly better fit (chi-square $(7) = 39.966$, $p < 0.001$) and the addition of the social skills variable
increased the ratio of chi-square to degrees of freedom above the recommended level of 3. Depression was directly related to deficient social skill ($\beta = 0.20$), confirming Hypothesis 2, while self-reactive outcome expectations preceded preference for online social interaction ($\beta = 0.15$), supporting Hypothesis 3. The path from self-reactive outcome expectations changed slightly ($\beta = 0.15$), but the remaining path coefficients and the overall variance explained in negative consequences were unchanged. The modification indices suggested a correlated error term between deficient social skills and deficient self-reaction, but this modification was not necessary to produce an acceptable fit.

In Table 3.1, one-way ANOVA with pre-planned contrasts was used to distinguish social (messaging and social networking) activities from others (downloading, gaming, and shopping).

Preference for online social interaction differed by activity ($F(4,629) = 3.12, p < 0.05$); however, the planned contrast was not significant ($t(29.6) = 0.956$, n.s., equal variances not assumed) and so H4a was rejected. Deficient social skills did not differ among activities ($F(4,629) = 0.756$, n.s.) so H4b was not supported. Negative consequences varied across favorites ($F(4,629) = 19.06, p < 0.001$) and the planned contrast was significant ($t(80.7) = –3.29$). However, the pattern of means was not the one proposed in H5, with gamers experiencing

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<tr>
<td>sd 1.22</td>
<td>1.12</td>
<td>1.54</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note
Common superscripts (i.e. a, b, c) denote common means within rows, Tukey HSD **p < 0.001, *p < 0.05.
the most negative outcomes ($M = 3.20, SD = 1.53$) and about equal levels found among downloaders ($M = 1.97, SD = 1.23$), social networkers ($M = 1.85, SD = 1.09$), messagers ($M = 1.86, SD = 1.14$), and shoppers ($M = 1.58, SD = 0.84$).

To test Hypothesis 6, the integrated model was applied to four favorite activities and differences among path coefficients were examined (Tables 3.1 and 3.2). Online shopping had too few cases to be included and the results for gaming should be interpreted with caution for the same reason. There were no significant differences among the paths linking deficient social skills to the preference for online social interaction to deficient self-reaction. Therefore, hypothesis 6 was disconfirmed.

In answer to RQ1, online gaming had the highest overall level of negative consequences (Table 3.1) and also the highest levels of deficient self-regulation and self-reactive outcome expectations. However, the paths from depression to self-reactive outcome expectations, from self-reactive outcome expectations

### Table 3.2 Path coefficient comparisons among favorite Internet activities

<table>
<thead>
<tr>
<th>Path</th>
<th>Standardized $\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SNSs</td>
</tr>
<tr>
<td>1 Depression → Self-reactive outcome expectation</td>
<td>0.15*</td>
</tr>
<tr>
<td>2 Depression → Deficient social skill</td>
<td>0.23**</td>
</tr>
<tr>
<td>3 Self-reactive outcome → Preference online social</td>
<td>0.09</td>
</tr>
<tr>
<td>4 Deficient social skill → Preference online social</td>
<td>0.33**</td>
</tr>
<tr>
<td>5 Depression → Deficient self-reaction</td>
<td>0.15*</td>
</tr>
<tr>
<td>6 Preference online social → Deficient self-reaction</td>
<td>0.28**</td>
</tr>
<tr>
<td>7 Self-reactive outcome → Deficient self-reaction</td>
<td>0.03</td>
</tr>
<tr>
<td>8 Deficient self-reaction → Deficient self-observation</td>
<td>0.35**</td>
</tr>
<tr>
<td>9 Self-reactive outcome → Deficient self-observation</td>
<td>0.24**</td>
</tr>
<tr>
<td>10 Self-reactive outcome → Negative consequences</td>
<td>0.22**</td>
</tr>
<tr>
<td>11 Deficient self-reaction → Negative consequences</td>
<td>0.50**</td>
</tr>
<tr>
<td>12 Deficient self-observation → Negative consequences</td>
<td>–0.07</td>
</tr>
<tr>
<td>Variance explained in negative consequences (R²)</td>
<td>0.28</td>
</tr>
</tbody>
</table>

Notes

Italics denote significantly different path coefficients among groups ($p<0.05$). *Significant path coefficient, $p<0.05$; **Significant path coefficient $p<0.001$. SNSs = Social networking services, DWN = Downloading, GAM = Gaming, MSG = Messaging.
to deficient self-reaction, and from self-reactive outcomes to negative consequences were not significant, so there was no evidence of a pattern of Internet use in the service of mood management. A case could also be made for downloading as the most problematic in that the latter two paths ($\beta = 0.25$, $\beta = 0.31$, and $\beta = 0.20$ respectively, all $p < 0.001$) were significant even though the levels of negative consequences, deficient self-reaction, and self-reactive outcome expectations were moderate compared to other activities. The links between depression and self-reactive outcomes ($\beta = 0.15$, $p < 0.05$) and between self-reactive outcomes and negative consequences ($\beta = 0.22$, $p < 0.001$) were significant for social networking, indicating its possible use for mood adjustment and its potential for interfering with important life activities. Also, the level of deficient self-reaction was higher for social networking than for all other activities, save for online gaming, although still below the midpoint of the scales used. Moreover, the link between self-reactive outcomes and deficient self-reaction was not confirmed ($\beta = 0.03$, n.s.), suggesting a behavior that is still under effective self-regulation.

**Discussion**

Prior studies of Internet habits, whether described as problematic (Caplan, 2005), addictive (Young & Rogers, 1998), or unregulated (LaRose et al., 2003) media behaviors, did not distinguish among different types of online activities. The current study asked the participants to focus on their favorite online activity; in order of popularity, they were social networking, downloading entertainment media files, messaging, gaming, and online shopping.

The present research re-examined the structure of media habits within socio-cognitive theory to articulate two dimensions associated with habitual use, deficient self-observation, and deficient self-reaction. Incorporating these concepts, LaRose et al.’s (2003) model of unregulated Internet use explained negative life consequences. In this model, depression preceded self-reactive outcome expectations and deficient self-reaction. Deficient self-reaction and self-reactive outcome expectations both predicted deficient self-observation and negative life consequences, and self-reactive outcome expectations also preceded deficient self-reaction. Deficient self-reaction, an indication of the lack of intentionality and lack of controllability of media habits, emerged as the single most powerful predictor of negative life consequences.

A second dimension of media habits, deficient self-observation, also predicted negative life consequences, but the sign of the relationship was opposite to the one expected. This might be interpreted to mean that, with repetition, individuals become inattentive to their favorite online activity as control over it gradually shifts from the cortex to (non-conscious) processes governed by
the basal ganglia (Yin & Knowlton, 2006). They are then perhaps less likely to perceive that they “have a problem” by failing to recognize that their involvement with their favorite online activity has impacted their school, work, or social activities. This could be an act of denial or the result of lack of conscious awareness of the extent of their involvement in their favorite pastime. But there is also the possibility that the causal relationship is in the opposite direction of that proposed in the model; that is, that negative life consequences cause individuals to become more attentive to their media consumption behavior, causing deficient self-observation to decrease. That would be an indication of a moderating process through which effective self-regulation might be restored. A third possibility is that both mechanisms are in play, with the former operative at relatively early stages of habit formation when individuals are merely indulging in enjoyable activities and the latter when excessive indulgence has severe consequences.

However, the latter mechanism is unlikely to have played a major role in the current study since there were few, if any, “problematic” Internet users in the sample, a statement that can also be made about previous research involving student samples, including Caplan (2005) and LaRose et al. (2003). In the present sample, only seven individuals (four of whom listed gaming as their favorite online activity) strongly agreed that they had suffered even one of the three negative consequences associated with their favorite activity and thus might be said to be experiencing “severe” life consequences required for a diagnosis of a mental disease (Shaffer et al., 2000). But the consequences (missing work or social activities or dropping a grade in a class) are perhaps in themselves not dire enough to constitute a diagnosis of mental illness. Flunking out of school, for example, might be such a consequence, but those persons would not appear in the present sample of college students, nor in the previously cited ones.

Thus, what emerges is a model of habitual Internet activities rather than problematic ones. However, we would argue along with LaRose and Eastin (2004) that a further understanding of the mechanisms that contribute to habitual media consumption make an important contribution. The process by which media selections turn into favorite activities, whether or not they lead to negative consequences, should be of interest both to media scholars and to practitioners.

The social skill account fared less well than previously (Caplan, 2005), and did not produce an acceptable fit to the current data. The compulsive use variable of the social skill model, called deficient self-reaction here, was a consistent predictor of negative consequences across all activities. However, adding two variables introduced in Caplan’s (2005) social skill model of PIU, deficient social skill and preference for online social interaction, did not improve
the overall model fit nor did they increase the variance explained in negative life consequences compared to the socio-cognitive variables alone. Thus, the effects of the unique social skill variables may be accounted for by the socio-cognitive model. Moreover, Social Cognitive Theory offers an explanation for a connection between deficient social skill and deficient self-reaction that would be necessary to fit the current data: Both could reflect an underlying inability to regulate one’s behavior effectively, both in the real-world social realm and in the online world.

At the time of Caplan’s (2005) work, social uses of the Internet did not include social networking websites (e.g., MySpace, Facebook). Since these are now the dominant online activity among college students, it might be expected that the social skill account would be more powerful than ever, but it did not hold in the current study. Also, the social networking and messaging activities that might be expected to be most amenable to the social skill explanation did not differ from downloading or gaming with respect to the impact of deficient (real-world) social skill and preference for online social interaction. However, it might be argued that all of the favorite online activities examined here involve extensive social interaction. For example, multiplayer online games like World of Warcraft typically require online interactions to plan group activities, such as raids on other groups of players (Ducheneaut & Moore, 2004). File sharers interact to share their interests in entertainment and to locate rare or good-quality files to download (LaRose & Kim, 2007).

Among favorite online activities, there was little evidence that social networking services were especially problematic compared to other favorite online pursuits. Social networking, along with messaging, was associated with a higher degree of deficient self-observation compared to other favorite online activities, but it appeared that social networking behavior was still guided by effective self-regulation.

Online gaming was perhaps the most problematic since it was associated with the highest levels of negative consequences, deficient self-reaction, and self-reactive outcome expectations. And, four of the seven most problematic cases in the present sample were gamers. This confirmed recent findings that online gaming is one of the most likely reasons for compulsive Internet use (Meerkerk, Van Den Eijnden, & Garretsen, 2006). However, there were three vital “missing links” in the path model for gaming, from depression to self-reactive outcome expectations and then to deficient self-reaction and negative consequences, that would indicate a pattern of “self-medication” with online games as the “drug.” This pattern was not found among the gamers in the present study.

To understand how favorites may change into problematic habits, consider that Figure 3.1 represents but one iteration in what can become a recurring
cycle. Negative consequences lead to increased dysphoria, diminished self-regulation, and renewed efforts to adjust dysphoric states through further media use, leading to yet more negative consequences, and so on. Media consumption could become a classically conditioned response (i.e., a habitual reaction triggered by external stimuli such as the sight of one’s computer) to dysphoric moods, resulting in a complete loss of self-control (i.e., highly deficient self-reaction), deepening the spiral until the individual “bottoms out” by experiencing the loss of job, marriage, or home. Such cases would conform to the etiology of addictive behavior (Marlatt et al., 1988).

Individuals might also exit the cycle in various ways. The experience of negative life consequences could heighten awareness of the activity and restore effective self-observation of the (negative) outcomes of excessive Internet behavior. Conscious efforts to reduce excessive use, such as indulging feelings of guilt or self-administering rewards for moderate behavior, would restore effective self-reaction and also re-direct attention to the behavior, further bolstering self-observation. With continual repetition, favorite activities might also lose their ability to modify dysphoric moods.

The present results lend new credence to the “time inelasticity” argument (Nie, 2001) to explain the negative effects of the Internet. The amount of usage of favorite Internet activities was directly related to negative consequences ($r = 0.32$, $p < 0.001$), suggesting that time displacement may account, in part, for negative effects of the Internet. Efforts to explain away such effects (e.g., Bargh & McKenna, 2004) may suffer from the same criticism that inspired the present research, that all Internet use is not the same. The positive effects of some types of Internet use may offset the negative effects of others and lead to misleading conclusions about underlying causal mechanisms.

For example, messaging differed from other favorites in that it was the only online activity for which there were significant paths from expected self-reactive outcomes to preference for online social interaction and from deficient self-observation to negative consequences, although both paths were significant across all activities in the combined sample. Also, messaging was the only activity for which the path from deficient social skill to preference for online interaction, a key link in the social skills account, was not significant. Unlike social networkers, among the messagers the paths from depression were not significant, nor was the path from deficient social skill to preference for online social interaction. Thus, the social skill account has merit for social networking but does not appear to account for online social interaction involving email and other forms of messaging. Rather than responding to unsatisfying real-world interactions by seeking new relationships online, the messagers may have learned to expect instant messages will maintain satisfying existing relationships.
Limitations

The present results may not be generalized to other populations. The Internet usage patterns of college students might be unique, both with regard to the use of social networking applications and with respect to the prevalence of problematic forms of use (Byun, Celestino, Mills, Ajecia, et al., 2009). Second, some of the more problematic applications of the Internet, such as online gambling and pornography, were not sufficiently prevalent in the current study to permit separate analyses. The negative consequences reported by the sample were also at the low ends of their respective scales. At-risk populations should be targeted for future data collection. Finally, structural equation modeling with cross-sectional data can only test assumptions about the direction of causality, not establish them conclusively.

Implications for Further Research

The present model of media might be expanded to include the third submechanism of self-regulation, judgmental process. LaRose and Kim (2007) found that holding behavior up to lax standards (e.g., the downloading behavior of other college students) decreased perceptions that self-regulation was deficient and thus might impair efforts to restore effective self-control.

Time-series studies should explore feedback loops in the current model; for example, a connection from the experience of negative life consequences to depression has not been explored in extant time-series research (Bessiere et al., 2008). The further connection between depression and self-reactive outcome expectations would in turn complete the “missing links” in a downward spiral through which media use mounts to offset dysphoric moods, resulting in further negative consequences as the media compete with other life activities, ending in a behavioral addiction (Marlatt et al., 1988).

Reward sensitivity has been identified as a possible underlying cause of the various types of disorders that have been identified with PIU/Internet Addiction (Hollander, 2006). Reward sensitivity might be understood in socio-cognitive terms as a causal linkage between self-reactive outcome expectations for a favorite media activity and negative life outcomes. This concept should be tested as a possible mediator of that relationship.

Summary

The present research redefined what had been called problematic, addictive, or unregulated Internet behavior as habitual media consumption. Two competing explanations of the negative consequences of Internet use were compared and integrated into a model grounded in Social Cognitive Theory.
The causal mechanisms underlying favorite activities were found to differ. As the Internet absorbs and creates more forms of entertainment and interpersonal communication, it will be increasingly important to draw distinctions among online activities. However, based on the current results, social networking services appear to be no more problematic, addictive, or even habitual than others despite their widespread popularity and popular press accounts of “Facebook addiction.”

**Notes**

1. The authors would like to thank the following students for their assistance in the completion of this research: Michelle Bruneau, Jennifer Beal, Dave Beaudoin, Christy Lee, Su Yun Cho. Correspondence should be addressed to the first author.
2. Termed “habit strength” in the original.
3. Called “deficient self-regulation” in the original.
4. They omitted indicators of un-intentionality on the premise, one not shared by other social psychologists (e.g., Wood & Neal, 2007), that habits are goal-directed automatic behaviors that therefore possess intentionality.
5. The relationship turned negative in multiple regression analysis, suggesting the existence of a suppressor variable.
6. Social networking (e.g., Facebook, MySpace), Downloading or streaming music, Downloading or streaming videos, Instant Messenger, Online gaming (e.g., Everquest, World of Warcraft), Online gambling, Online shopping, Online pornography, Chatrooms, Auctions (e.g., eBay), Email.
7. I do it without thinking. I do it automatically. It makes me feel weird if I do not do it. I do it without having to consciously remember. It is part of my usual routine.
8. I have to keep doing it more and more to get my thrill. I have a hard time keeping my use under control. I sometimes try to conceal how much time I spend on it from my family or friends. I feel guilty about the amount of time I spend on it. I would go out of my way to satisfy my urge to do it.
9. As a result of indulging your favorite activity, how likely are you to . . . Miss class or work? Lose a grade in a course? Miss a social event?
10. As a result of indulging your favorite activity, how likely are you to . . . Feel less lonely? Feel relaxed? Forget your problems? Feel better when you are down?
11. Below is a list of some of the ways you might have felt or behaved. Please tell us how often you have felt this way during the PAST WEEK by clicking the appropriate number: I was bothered by things that usually don’t bother me, I had trouble keeping my mind on what I was doing, I felt depressed, I could not “get going.”
12. It is easy for me to do. I am confident I have mastered all of its fine points. I am confident I can overcome any barrier to my enjoyment of it.
13. I have trouble changing my behavior to suit different people and different situations. Even when it might be to my advantage, I have difficulty putting up a good front (both reflected).
14. I am treated better online than in face-to-face relationships. I feel safer relating to others online rather than face-to-face. I am more confident socializing online than offline.
References


