

Effects of Motor Impulsivity and Sleep Quality on Swearing, Interpersonally Deviant and Disadvantageous Behaviors on Online Social Networking Sites

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Highlights

- Three problematic behaviors on social networking sites were identified.
- These include Swearing, Interpersonally Deviant and Disadvantageous Behaviors.
- While motor impulsivity predicts these behaviors, poor sleep quality does not.
- Poor sleep quality enhances motor impulsivity effects on these online behaviors.
- Motor impulsivity effects are significant only when sleep quality is low.

Abstract

Reports point to an increase in problematic uses of social networking sites that may include swearing, interpersonally deviant and disadvantageous online behaviors. The etiology of such behaviors, though, is still unknown. Relying on models borrowed from the offline problematic behavior (e.g., gambling, substance abuse) and neurocognitive literatures, we theorize that such behaviors are driven, in part, by elevated motor impulsivity and poor sleep quality, which is also a growing concern in modern society; and that poor sleep quality strengthens the effects of motor impulsivity on the examined range of problematic behaviors, after accounting for stress effects. To test this model we conducted a time-lagged study involving 384 young adults from the US who use social networking sites. Findings based on

structural equation modeling analyses reveal that (1) motor impulsivity drives some problematic online behaviors, (2) poor sleep quality (at normative levels) does not directly influence these behaviors, and (3) poor sleep quality augments the effect of motor impulsivity on swearing, interpersonally deviant, and disadvantageous online behaviors, after accounting for stress effects. The results point to possible etiological underpinnings of problematic online behaviors and can serve as a springboard for the development of interventions that target such factors.

Keywords: impulsivity, sleep, social networking sites, problematic behaviors, swearing

1. Introduction

The proliferation of social networking sites (SNS) has been largely advantageous for many people, but has also led to the emergence of a range of modern-day problematic behaviors (i.e., behaviors that are disadvantageous to users in the long run and/or are deemed to be socially unacceptable and less civil). These include deviant online behaviors such as using coarser rhetoric among users or virtually attacking other people (Siegel, 2009); and the use of SNS at inappropriate times such as while driving (Turel & Bechara, 2016a) or when talking face-to-face with other people (Turel & Bechara, 2016b). Consequently, 47% of Facebook walls contain profanity (Davis, 2011) (words that are judged to be profane by many members of a society, e.g., "fuck", "shit", "bitch"), 40% of drivers report some level of SNS use while driving (Turel & Bechara, 2016a), and many report frequent impulsive, unplanned use of such sites, even in situations in which they are not supposed to use such sites (Turel & Bechara, 2016b). Such behaviors can be conceived as problematic since they can be dangerous (e.g., using SNS while driving), infringe social civility and promote online and offline aggression (e.g., swearing online or using a cellphone while talking to other people), or be less advantageous for users (e.g., using SNS instead of studying or working). Hence, understanding the etiology of such behaviors is warranted and can lead to the development of efficacious interventions.

This study suggests that problematic online behaviors on SNS can be rooted, at least in part, in individual differences associated with brain systems that govern impulsive and problematic behaviors and with situational factors that can influence such systems. First, the literature on rewarding yet disadvantageous and often perceived-to-be deviant behaviors such as gambling and drug abuse suggests that trait impulsivity (a stable tendency to act rashly and engage in behaviors without adequate forethought) is a key driver of such behaviors (Verdejo-Garcia, Lawrence, & Clark, 2008). This trait is fairly steady and varies normatively among healthy subjects (Patton, Stanford, & Barratt, 1995). Its effect on problematic behavior stems from its well-established associations with poor inhibitory control, with flawed future discounting and reward sensitivity (Verdejo-Garcia et al., 2008), and with lack of proper forethought in decision-making (Jentsch & Taylor, 1999).

Impulsivity can manifest through many facets, including attentional/ cognitive (making quick decisions without considering all facts), motor (acting rashly without thinking), and non-planning (orientation toward present gains) impulsiveness (Patton et al., 1995). It is assumed that the motor facet is most relevant for explaining spontaneous yet often deviant or harmful use of SNS because it captures low ability to inhibit pre-potent behavioral responses (Bechara, Damasio, & Damasio, 2000), such as using aggressive, profane, and inappropriate online language, or using websites in inappropriate situations. Hence, our first hypothesis is that motor impulsivity will be positively associated with a range of problematic behaviors SNS, including swearing (use of words that are largely deemed to be profane by a society), interpersonally deviant uses (behaviors that can offend or harm other people), and disadvantageous uses (behaviors that are largely socially or explicitly prohibited and can be potentially harmful).

Poor sleep quality, which reflects underperformance on various sleep dimensions including falling and staying asleep, sleep duration and after-sleep alertness, is another contributing factor to poor decision-making and consequent impulsive and problematic behaviors (Killgore, Balkin, & Wesensten, 2006). The reason is that poor sleep adversely influences prefrontal cortical functioning (Durmer & Dinges, 2005), which translates into weak behavioral inhibition, and more impulsive and aggressive behaviors (Anderson

& Platten, 2011). Indeed, poor sleep quality has been associated with many problematic behaviors, including drug use and relapse, cigarette smoking, and gambling, as well as with aggressive behaviors (Kamphuis, Meerlo, Koolhaas, & Lancel, 2012). Since poor sleep is often linked to stress (Huang et al., 2011), which can have similar and confounding effects on problematic behaviors (Sinha, 2001), one needs to control for stress effects before isolating sleep effects on problematic behaviors. The second hypothesis is therefore that poor sleep quality will be positively associated with problematic behaviors on SNS, including swearing, interpersonally deviant uses, and disadvantageous uses, after controlling for stress effects.

Poor sleep quality has also the potential to disturb normal body physiology by creating a sense of persistent disturbance (tiredness) that people normally want to address, for example, by cognitively suppressing it, consuming stimulants, or going to sleep. Such perturbations in the visceral and internal body state have been proposed to be linked to activity in the insular cortex (Contreras, Ceric, & Torrealba, 2007) and can be induced by a variety of conditions, including poor sleep (Chen et al., 2016). When a sense of perturbation in body physiology is generated (e.g., through tiredness), these interoceptive signals are received by the insula, which in turn mobilizes a series of neural events that lead to behavioral actions concerned with paying attention to immediate events that help correct or turn attention away from these perturbations. The end result of this insular activity is the promotion of impulsive behaviors and the hijacking of decision-making processes concerned with the control of these impulses (Naqvi & Bechara, 2010).

Consistent with this view, it has been shown that sleep deprivation creates perturbations that promote impulsive behaviors and lower inhibitions (Anderson & Platten, 2011). The neural mechanism of such perturbations involves the engagement of the insular system, which increases the brain's reliance on the impulsive brain system (Noel, Brevers, & Bechara, 2013). Using this logic of perturbation effects, we propose here to test the hypothesis that sleep disturbances, as manifested in poor sleep quality, increase the reliance on the impulsive brain system and reduce inhibition abilities (Turel & Bechara, 2016b).

Hence, the third hypothesis is that poor sleep quality will moderate (strengthen) the association between

motor impulsivity and problematic behaviors on SNS, including swearing, interpersonally deviant uses, and disadvantageous uses, after controlling for direct and moderating stress effects.

Beyond stress controls, we controlled for other factors that may influence problematic online behaviors, including age and sex (Livingston & Room, 2009), number of contacts on the SNS (which can provide motivation and opportunity to engage in problematic behaviors (Turel & Bechara, 2016a)), and grade point average (GPA) because, as an indirect manifestation of self-control, intellect and school misconduct, it can also relate to problematic online behaviors (Qahri-Saremi & Turel, 2016).

2. Methods

2.1. Participants

Participants were recruited from a population of university students who use SNS. This segment of the population was deemed appropriate for this study since it often has some level of sleep disturbances (Lund, Reider, Whiting, & Prichard, 2010) and it tends to use SNS, including problematic use (Karpinski, Kirschner, Ozer, Mellott, & Ochwo, 2013), more than others. The study was approved by the institutional review board of an American university. Exclusion criteria were: (1) younger than 18 years old, or (2) not actively using SNS. All participants gave written informed consent when they started the study. For the pilot study, 84 people were invited and 65 completed the two surveys (77.3% response rate). For the main study 481 people were invited and 384 completed the two surveys (79.8% response rate). No exclusions were made.

2.2. Procedure

The same procedures were employed for both the pilot and main studies. Participants were invited via the online learning system of a statistics class to voluntarily participate in a study of SNS use behaviors in exchange for bonus points. The study required the completion of two online surveys. Participants who completed the first survey were invited via email to complete a second follow-up survey one week after the first survey. The first survey and consent form gave no information about what would be measured in the second survey, thus minimizing any influence on normal behavior during the intervening week.

2.3. *Measures*

Since participants can use multiple SNS, they were asked to focus on the one site they use the most. The first survey included descriptive variables and the individual differences on which this study focuses. The second survey captured self-reported sleep quality, stress, and problematic behaviors over the previous week. All measures were valid and reliable adaptations of existing scales and items. Because some were adapted to the SNS context or modified/ shortened, they were pilot tested. They presented reasonable psychometric properties both in the pilot test and the main study. Scales and descriptive statistics are given in the Appendix.

2.4. *Statistical Analysis*

Given that the model includes a complex net of relationships with multiple outcome variables and latent factors, the structural equation modeling (SEM) facilities of AMOS 24 were used to estimate it. The analysis followed the two-step approach (Anderson & Gerbing, 1988), starting with a confirmatory factor analysis model. In the second step a sequence of structural models was estimated. Since negative phenomena often do not follow the normal distribution (Turel, Serenko, & Giles, 2011), bias-corrected bootstrapping (500 resamples, 95% confidence interval, two-tailed significance) was used for estimate generation. This approach imposes no distribution assumptions on the variables; it is also useful for assessing moderation effects since the product of two variables typically produces non-normal residuals (Preacher, Rucker, & Hayes, 2007). Two-tailed p-values are reported. Common cutoff criteria were used for assessing model fit (Hu & Bentler, 1999). Moderation plots and path coefficients were generated with the Interaction package (<http://www.danielsoper.com/Interaction/>).

3. **Results**

The sample included 384 young adults (average age of 23.30, range=18-47, SD=3.84, 83.6% in the 18-25 age range, 14.3% in the 26-35 age range, and 2.1% in the 36-47 age range) who use SNS. Most participants reported on the use of Facebook (225, 58.6%) or Instagram (114, 29.7%). Other sites included Twitter (21, 5.5%), LinkedIn (12, 3.1%) and a variety of others (tumblr, Pinterest, etc.). The

sample included 51.6% (198) female participants. Participants had on average 328.6 contacts on their SNS (range=1-4,687, SD=399.89) and an average extrapolated (based on ranges) current grade point average of 3.08 (SD=1.53). The average extrapolated Perceived Sleep Quality Index (PSQI) score based on the two PSQI components the survey included (components # 1 and 7) was 10.16 (0-21, SD=4.97). Based on this score and the recommended cutoff of 5 for the sum of the seven components (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989), our sample included 76 "good" sleepers and 308 "poor" sleepers, which seems reasonable for a college-age population.

A confirmatory factor analysis model that included all multiple-item constructs produced good fit indices [$\chi^2(362) = 718.8$, CFI = 0.93, IFI = 0.93, RMSEA = 0.051, with p-close = 0.40 and SRMR = 0.051] and all modeled factor loadings were significant ($p < 0.001$). Hence, a sequence of structural models was estimated. The results (fit indices, two-tailed, bias-corrected standardized effects based on bootstrapping, explained variance in endogenous constructs, and effect sizes) are given in Table 1. The first model included all control variables. The second model included only the significant controls for parsimony reasons (Sex and Contacts were removed), as well as the main (direct) effects. The third model included the remaining significant controls, the possible moderation effect of stress as an additional control, and the hypothesized direct and moderation effects. The final moderation model is depicted in Fig 1. Moderation plots are provided in Fig 2. The results demonstrate that while impulsivity can increase problematic uses of SNS, these effects become pronounced primarily when people have poor sleep quality (i.e., greater than one standard deviation below the mean of Poor Sleep) and become negligible (non-significant) at higher levels of sleep quality (i.e., less than one standard deviation below the mean of Poor Sleep).

Table 1. Model Fit Indices, Coefficients, Explained Variances, and Effect Sizes ^{†,††}

| | Base Model – Only Controls | Main Effects Model | Moderation Model |
|--|---|---|---|
| Fit Indices | $\chi^2(206) = 452.0$, CFI = 0.94, IFI = 0.94, RMSEA = 0.056 with p-close = 0.08, and SRMR = 0.045 | $\chi^2(408) = 833.9$, CFI = 0.92, IFI = 0.92, RMSEA = 0.052 with p-close = 0.23, and SRMR = 0.051 | $\chi^2(431) = 839.9$, CFI = 0.92, IFI = 0.92, RMSEA = 0.050 with p-close = 0.52, and SRMR = 0.049 |
| Age → Disadvantageous use | -0.191 (0.003) | -0.207 (0.004) | -0.199 (0.003) |
| Sex → Disadvantageous use | 0.073 (0.177) | | |
| GPA → Disadvantageous use | -0.124 (0.038) | -0.083 (0.195) | |
| Stress → Disadvantageous use | 0.169 (0.011) | 0.159 (0.058) | 0.159 (0.044) |
| Contacts → Disadvantageous use | 0.058 (0.301) | | |
| Age → Swearing | -0.021 (0.661) | -0.022 (0.620) | -0.022 (0.664) |
| Sex → Swearing | 0.038 (0.439) | | |
| GPA → Swearing | -0.010 (0.852) | 0.011 (0.738) | |
| Stress → Swearing | 0.203 (0.007) | 0.173 (0.008) | 0.175 (0.006) |
| Contacts → Swearing | -0.027 (0.553) | | |
| Age → Interpersonal deviance | 0.072 (0.177) | 0.067 (0.195) | 0.064 (0.226) |
| Sex → Interpersonal deviance | -0.022 (0.746) | | |
| GPA → Interpersonal deviance | 0.011 (0.903) | 0.042 (0.415) | |
| Stress → Interpersonal deviance | -0.008 (0.771) | -0.043 (0.379) | -0.041 (0.358) |
| Contacts → Interpersonal deviance | 0.042 (0.492) | | |
| Stress*Impulsivity → Disadvantageous use | | | 0.017 (0.840) |
| Stress*Impulsivity → Swearing | | | 0.011 (0.915) |
| Stress*Impulsivity → Interpersonal deviance | | | 0.010 (0.887) |
| Impulsivity → Disadvantageous use | | 0.199 (0.011) | 0.214 (0.003) |
| Impulsivity → Swearing | | 0.097 (0.204) | 0.085 (0.155) |
| Impulsivity → Interpersonal deviance | | 0.136 (0.040) | 0.119 (0.070) |
| Poor sleep → Disadvantageous use | | -0.006 (0.725) | -0.07 (0.670) |
| Poor sleep → Swearing | | 0.069 (0.333) | 0.074 (0.319) |
| Poor sleep → Interpersonal deviance | | 0.038 (0.613) | 0.046 (0.624) |
| Poor sleep*Impulsivity → Disadvantageous use | | | 0.115 (0.030) |
| Poor sleep*Impulsivity → Swearing | | | 0.156 (0.004) |
| Poor sleep*Impulsivity → Interpersonal deviance | | | 0.147 (0.012) |
| R ² [Disadvantageous Use, Swearing, Interpersonal deviance] | [9.8%, 4.7%, 0.7%] | [12.7%, 5.9%, 2.4%] | [13.7%, 8.5%, 4.6%] |
| f ² of Added Constructs [Disadvantageous Use, Swearing, Interpersonal deviance] | Baseline | [0.03, 0.01, 0.02] | [0.05, 0.04, 0.04] |

[†] p-values are provided in parentheses next to the coefficients

^{††} Effect sizes, f^2 , were calculated using the formula $[R^2(\text{current model}) - R^2(\text{baseline})] / [1 - R^2(\text{current model})]$.

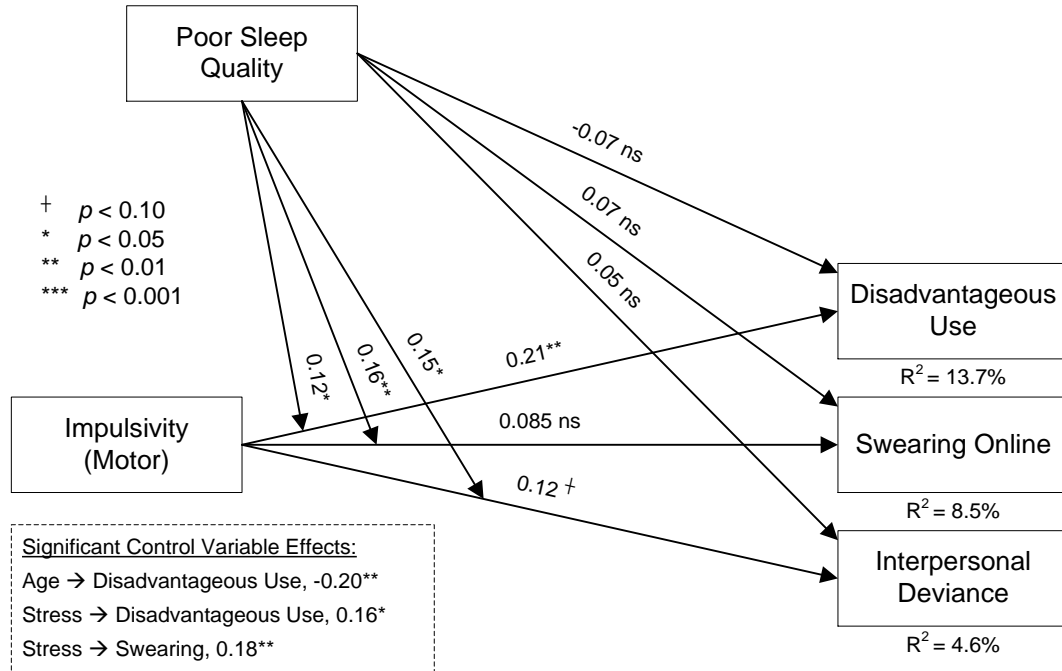


Figure 1. Structural Model

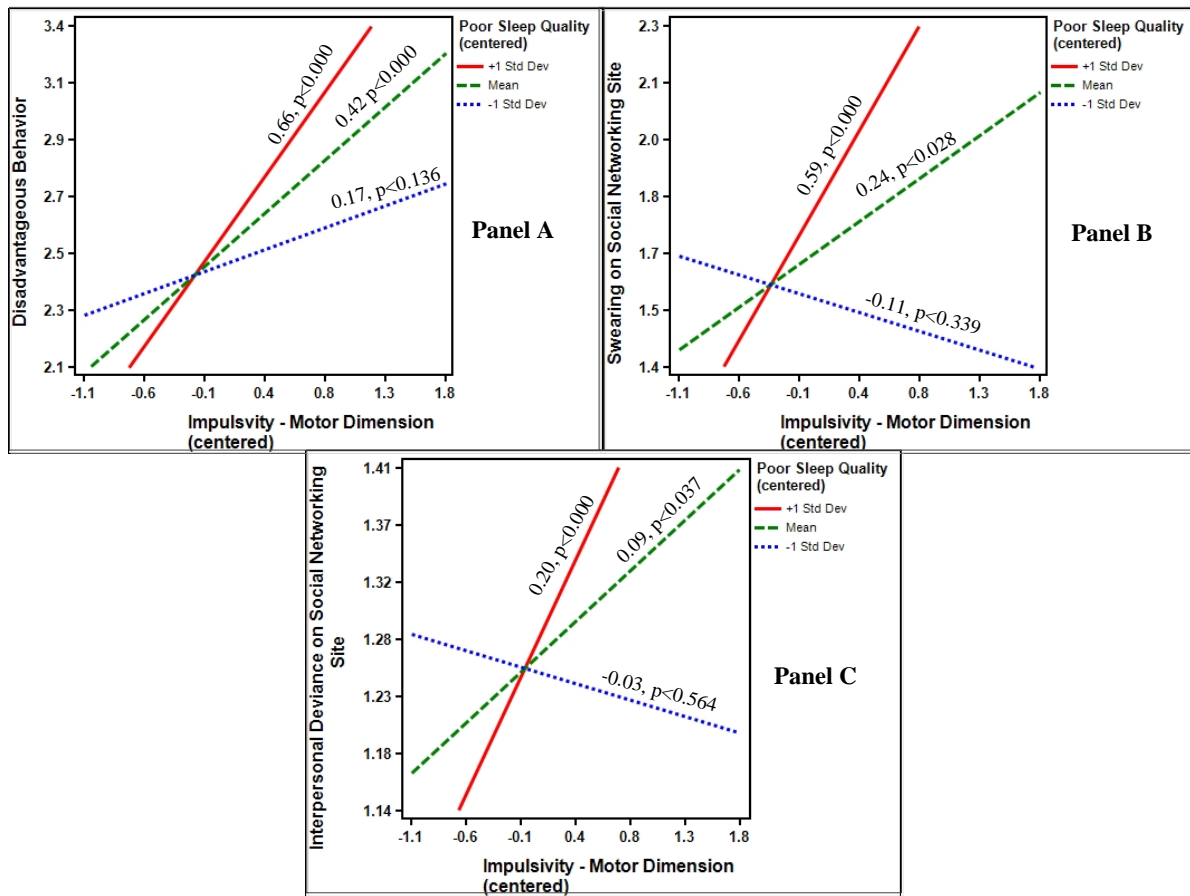


Figure 2. Interaction Plots

4. Discussion

In this study of SNS users, we found that motor impulsivity and poor sleep quality can be culprits that explain, in part, the growing problematic use of SNS, including specifically behaviors such as disadvantageous uses, interpersonally deviant behaviors on these sites, and the use of profane language online. While motor impulsivity alone can significantly influence disadvantageous and interpersonally deviant uses of SNS, its effects on such behaviors become more noticeable when one reports on poor sleep quality during the examination period. To the best of our knowledge, this is the first study to assess the interplay of motor impulsivity and poor sleep quality, which are well established predictors of offline problematic behaviors, in the context of problematic online behaviors. Our findings can therefore serve as a springboard for understanding and ultimately intervening in online behaviors that are deemed by society to be inappropriate, potentially harmful, and undesirable.

Model 1 (Table 1) shows that age, stress, and GPA can be associated with different problematic online behaviors. Age predicted disadvantageous use; younger users seemed to engage more in such problematic behaviors than older users. This is consistent with studies showing that younger individuals, especially young-adults, engage more often than older individuals in disadvantageous online behaviors, perhaps due to the relatively delayed maturation and full development of their prefrontal cortices, the brain systems primarily implicated in risky behaviors, and poor behavioral inhibition (Casey, Getz, & Galvan, 2008), or perhaps due to having more free time than older individuals (Turel & Bechara, 2016b). This was not the case, though, with regard to the use of profane language and interpersonal deviance, which seem to be relatively equal across ages. This finding is consistent with the notion that swearing is persistent across most of the life span, though what is considered profane changes with age (Jay, 1992, 2000), and that interpersonal deviance can continue from young ages in school environments to adults in the workplace (Bennett & Robinson, 2000). Age effects were consistent across models, even after considering the effects of other controls and predictors.

Model 1 also showed that higher GPA was associated with lower levels of disadvantageous use of SNS. Since GPA can be conceived as an indirect proxy for intellect, long-term orientation and inhibition, this effect is consistent with prior research, which has linked reduced inhibition and intellect to problematic behaviors (Chambers, Garavan, & Bellgrove, 2009; Suhr & Hammers, 2010). This effect diminished, though, after accounting for impulsivity and sleep effects, which may be due the possibility that academic performance reflects, to some extent, low impulsivity and appropriate sleep.

Stress, in contrast, had a consistent influence on disadvantageous use of and swearing on SNS; it increased the frequencies of these problematic behaviors. This is consistent with findings indicating that stress creates body state perturbations that promote problematic behaviors as a means to cope with the stressors (Capriles, Rodaros, Sorge, & Stewart, 2003; McEwen, 2012). It is also consistent with specific findings that stress can promote swearing as either a relief mechanism or as a reducer of decision-making capacity (Vingerhoets, Bylsma, & de Vlam, 2013). Findings regarding controls also indicate that problematic SNS behaviors exist regardless of one's network size (number of contacts) and sex. This is partially consistent with prior research, which has shown that males tend to engage in more problematic behaviors than females, but this gap diminishes over time (Byrnes, Miller, & Schafer, 1999). Perhaps the Internet provides a level playing field for the sexes that affords similar uses of profanity (Siegel, 2009). This hypothesis, though, should be examined in-depth in future research.

Model 2 (Table 1) showed that motor impulsivity can explain increased engagement in several problematic uses of SNS, including specifically disadvantageous and interpersonally deviant uses. It appears that motor impulsivity better predicts SNS use at inappropriate times (disadvantageous use), than it predicts other forms of problematic behaviors (swearing [χ^2 difference test = 4.39(1), $p < 0.04$] and interpersonal deviance [χ^2 difference test = 2.76(1), $p < 0.09$]). In line with known offline effects of impulsivity on problematic behaviors (Spillane, Smith, & Kahler, 2010), trait impulsivity can also serve as a partial driver of problematic online behaviors. Hence, partial support was provided for the first hypothesis, which posited that motor impulsivity will increase the three studied problematic uses of SNS. In contrast, no support was provided for the second hypothesis, which posited that poor sleep will predict

problematic online behaviors. One explanation for our results is that many prior studies that have demonstrated sleep effects on problematic behaviors have used severe sleep deprivation in order to elicit these effects (Anderson & Platten, 2011). It is assumed that while our sample, on average, did not have ideal sleep, it reported normative PSQI scores ($M_{PSQI}=10.16$; range=0-21). Perhaps at higher levels of PSQI this effect will be more pronounced. This should be tested in future research using lengthy sleep deprivation interventions. Overall, Model 2 showed that trait impulsivity, but not poor sleep (at least at medium and normative levels of average sleep quality) can directly predict problematic online behaviors, after accounting for stress and age effects.

Model 3 (Table 1) showed that while poor sleep may not be a direct predictor of problematic online behaviors, it influences these behaviors by attenuating (positively moderating) the effects of motor impulsivity on these behaviors. The effects of motor impulsivity on all studied problematic online behaviors were dependent on the level of sleep quality the user had. In line with our hypotheses, users who reported poor sleep had more pronounced motor impulsivity effects. Hence, full support for H3 was provided.

Figure 2 sheds more light on these moderation effects. At lower levels of poor sleep quality (e.g., one standard deviation below the mean, i.e., a person who has above-average sleep quality), motor impulsivity does not predict swearing on, and disadvantageous and interpersonally deviant uses of SNS. In contrast, at higher levels of poor sleep quality (e.g., one standard deviation above the mean, i.e., a person who has below-average sleep quality), motor impulsivity effects on problematic online behaviors become significant. This finding calls for closer attention to sleep problems, which are a growing concern among children and adolescents (Ohayon, Carskadon, Guilleminault, & Vitiello, 2004) as well as working adults (Barnes & Spreitzer, 2015) as a means to explain problematic online behaviors, which themselves have also increased in prevalence (D'Arcy, Gupta, Tarafdar, & Turel, 2014).

Our findings could have important implications for parents, SNS users, educators and clinicians. They imply that impulsive SNS users can reduce problematic behaviors on such sites by increasing their sleep quality. This can be done through exercising self-control and increasing one's self-awareness to the

possible adverse effects of poor sleep. Parents, too, can reinforce adequate sleep among their children, especially if they have been diagnosed as impulsive, e.g., by reducing screen time before bed (Magee, Lee, & Vella, 2014) and increase children's awareness to poor sleep problems, as a means to alleviate problematic online behaviors. Educators can also increase awareness of the importance of adequate sleep, not only for academic performance, but also for proper online social conduct, especially with impulsive children. This can be done, for instance, through the use of training modules on appropriate online conduct, which are common in many levels of the education system (Turel, Mouttapa, & Donato, 2015). Clinicians dealing with inappropriate online conduct (e.g., Internet addiction, cyber-bullying) and impulsivity can look into sleep normalization (e.g., through the use of cognitive behavioral therapy), as a potential means for reducing problematic online behaviors. The merit of these suggestions, though, requires further research.

The study has several limitations. First, even though the studied problematic behaviors were captured one week after capturing motor impulsivity, motor impulsivity is a relatively stable trait, and sleep reports pertained to the week of the behavior, it is possible that there is spurious relationship between sleep, impulsivity and problematic behaviors. Hence, perfect causality cannot be demonstrated with the existing data. Second, our sample had relatively normative sleep patterns, which can explain the weak direct effects of poor sleep on problematic behaviors. While this level of sleep disturbances was sufficient for demonstrating moderation effects, future research may consider more acute sleep disturbances as a means to elicit stronger sleep quality effects. Third, our measures were subjective. Even though felt and subjective assessment of sleep may be more instrumental in determining sleep quality than direct measures of sleep, it would be nice to corroborate our findings with physiological measures of sleep quality. Similarly, future research may consider different and more direct approaches (e.g., by using SNS logs or journals) for capturing problematic SNS behaviors.

5. Conclusion

Problematic online behaviors are a growing concern among parents, educators, and clinicians. The medical community also acknowledges the need to delve into the root causes of such behaviors as a means to fix them among individuals with severe problems; for instance, see the inclusion of Internet Gaming Disorder in Section 3 of DSM 5 (American Psychiatric Association, 2013). This study sought to examine such mechanisms as related to three less-studied, yet very common, problematic online behaviors: swearing, interpersonal deviance and disadvantageous online use behaviors. The findings suggest that trait impulsivity and poor sleep quality can influence these behaviors. We call for future research to further examine the causes of these behaviors and test interventions that may alleviate them.

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Appendix

Table A1. Measurement Scales and their Properties[†]

| Sources | Items & Anchors |
|---|---|
| Survey 1 - t1 | |
| Impulsivity (Motor) (Spinella, 2007) $\alpha_{\text{pilot}} = 0.85$ $\alpha_{\text{main}} = 0.68$ $M = 2.06$ $SD = 0.54$ | People differ in the ways they act and think in different situations. This is a test to measure some of the ways in which you act and think. Read each statement and pick the answer that best describes you. Do not spend too much time on any statement. Answer quickly and honestly. [1 = Rarely/Never, 7 = Almost Always/Always] - I do things without thinking - I act on impulse - I act on the spur of the moment - I say things without thinking - I buy things on impulse |
| Descriptive variables | - What is your age [open ended] $M = 23.3$, $SD = 3.84$ - What is your sex [Male=0, Female=1] - How many contacts do you have on this social networking website [open ended] $M =$ |

| | |
|---|--|
| | 328.55, SD=399.88 - What is your current GPA:[1=<2.5 to 7= 3.9-4.0] M = 3.85, SD=1.53 |
| Survey 2 - t2 | |
| Swearing on the site (Gitter, 2010) $\alpha_{\text{pilot}} = 0.94$ $\alpha_{\text{main}} = 0.93$ M = 1.75 SD=1.18 | Reflecting on your use of this social networking site over the last week, how often did you swear or use offensive language on the site.... [1=Never to 7=Very often] ... to strengthen an argument ... to express your anger ... to express negative emotions ... to vent out |
| Interpersonally Deviant use of the site (Bennett & Robinson, 2000) $\alpha_{\text{pilot}} = 0.96$ $\alpha_{\text{main}} = 0.89$ M = 1.26 SD=0.44 | Please reflect on your use of this social networking website over the LAST Week. How often did you.... [1=never, 5=often] ...make fun of someone on the website ...say something hurtful to someone on the website ...make an ethnic, religious, or racial remark on the website ...curse at someone on the website ...play a mean prank on someone on the website ...act rudely toward someone on the website ...publicly embarrassed someone on the website |
| Disadvantageous use of the site (based on (Turel & Bechara, 2016a)) $\alpha_{\text{pilot}} = 0.87$ $\alpha_{\text{main}} = 0.72$ M = 2.63 SD=1.26 | Over the PREVIOUS WEEK, how often did you use the website.... [1=very rarely, 7=very often] ...while in class? ...while driving (even just checking)? ...while talking face to face with family or friends? ...while at work/ doing school work? |
| Poor Sleep Quality (Short version of (Buysse et al., 1989)) $\alpha_{\text{pilot}} = 0.89$ $\alpha_{\text{main}} = 0.69$ M = 1.12 SD=0.61 | As accurately as you recall, please answer the following questions regarding the LAST WEEK. During the last week, ... [0=Not during this week, 3=More than 3 times] ...how often did you have trouble falling asleep? ...how often did you have trouble staying asleep? ...how often have you had trouble staying awake while driving, eating meals, or engaging in social activity? ...how much of a problem has it been for you to keep up enthusiasm to get things done? How would you characterize the quality of the sleep that you had over the LAST WEEK? [0=extremely poor, 3=very good --reversed] |
| Stress (short version of (Cohen, Kamarck, & Mermelstein, 1983)) $\alpha_{\text{pilot}} = 0.94$ $\alpha_{\text{main}} = 0.89$ M = 2.58 SD=0.87 | Please reflect on your life situation over the last week, and state how often you have felt like the statements below. In the LAST WEEK.....[1=Never, 5=Very Often] ...how often have you felt that you were unable to control the important things in your life? ...how often have you felt UNconfident about your ability to handle your personal problems? ...how often have you felt that things were NOT going your way? ...how often have you felt difficulties were piling up so high that you could not overcome them? |

† M= average in the main study, SD= standard deviation in the main study

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