The Effect of Impulsivity on Phubbing: Perceived Stress and Online Vigilance as Mediators

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Article Info	Abstract
	Phubbing refers to the act of ignoring someone in a social environment by focusing on a smartphone rather than engaging in conversation. This behavior can negatively influence the quality of interpersonal relationships, relationship satisfaction, and feelings of well-being. The purpose of this study was to examine the mediating role of stress and online vigilance in the relationship between impulsivity and phubbing. The research data were obtained from 403 university students using the scales of self-control, perceived stress, online vigilance and phubbing. All the analyses were conducted using JASP, a program based on R software. The results of the study revealed that impulsivity predicts phubbing and that three indirect pathways existed: separate mediated effect of stress, separate mediated effect of online vigilance, and serial mediated effect of stress and online vigilance. This research provides valuable insights into the psychological structures associated with phubbing, as well as the potential mediating variables that may explain these relationships.

Introduction

Smartphones now constitute a central component of everyday life. With developing technologies, these devices are used not only for making calls but also for a wide range of other purposes. Smartphones, which are used in many areas from the business world to social life and from education to entertainment, help us manage our lives in a more efficient and organized way thanks to fast access to information, instant communication and various applications. This situation has caused many people to become unable to stay away from their smartphones (Turkle, 2011). On the other hand, despite its many advantages, the constant use of smartphones can demand users' attention, thus disrupting their interactions with those physically present (Mcdaniel et al., 2018; Roberts & David, 2016). In other words, people may sometimes become preoccupied with their smartphones in the presence of others. In the literature, this situation is referred to as "phubbing" (Chotpitayasunondh & Douglas, 2016). "Phubbing" is defined as the act of paying attention to one's smartphone while ignoring others in a social setting (Jamadi et al., 2023). It is considered a disrespectful behavior toward others and may harm social relationships in real life (Karadağ et al., 2015). Prior research has shown that phubbing can undermine the quality of interpersonal relationships, reduce relationship satisfaction, and impair individuals' sense of well-being (Chotpitayasunondh & Douglas, 2018a; Roberts & David, 2016).

In recent years, different researchers have examined factors related to phubbing behavior. These studies have shown that especially Fear of Missing Out (FOMO) and internet addiction are associated with phubbing behavior (Balta et al., 2020; Chotpitayasunondh & Douglas, 2016; Davey et al., 2018; Karadag et al., 2015; Schneider & Hitzfeld, 2021). Research also reveals that addictions to SMS, social media, mobile phones, and games positively affect phubbing behavior (Karadag et al., 2015). In another study, Li et al. (2023) found that perceived social norms influence phubbing through individual control and FOMO. *Studies that include the variable of gender* show that women are more likely to exhibit phubbing behavior (Balta et.al., 2020; Karadağ et al., 2015). Other studies have indicated that lack of self-control is a significant predictor of phubbing behavior (Davey et al., 2018; Benvenuti et al., 2020). *Benvenuti and colleagues (2020) reported that adults with low levels of self-control were at a higher risk of exhibiting phubbing behavior.*

Impulsivity is defined as a tendency to act without adequate planning or sufficient consideration of the consequences of one's behavior, often in a rapid and insufficiently regulated manner (Moeller et al., 2001). Although impulsivity and self-control are closely related constructs within the broader domain of self-regulation, they are conceptually distinct. Self-control generally refers to an individual's capacity to regulate behavior in accordance with long-term goals, whereas impulsivity is characterized by a stronger orientation toward short-term gratification and rewards, accompanied by a reduced consideration of potential consequences (Moeller et al., 2001; Tangney et al., 2004). According to Dawe, Gullo and Loxton (2004), impulsivity is a two-fold concept: "rash impulsivity" and "reward sensitivity". Rash impulsivity refers to the urge to engage in behaviors like impetuousness, lack of planning or lack of careful thought. Reward sensitivity can be said to include "attention-seeking behavior" caused by rewarding stimuli or events. *Smartphones, which facilitate online communication, offer numerous opportunities that satisfy users* (e.g., quick and easy access to information, social interaction rewards, success in problem-solving and so on) (Oulasvirta et al., 2012). Thanks to these opportunities, users can

establish positive relationships with the online environment, which in turn encourages them to prefer and use online communication more frequently (Reinecke et al., 2018). Social media applications, especially those that provide instant feedback, messages and notifications, present an attractive stimulating environment for impulsive individuals (Canale et al., 2019). Given these characteristics, it is not surprising that impulsivity has been widely associated with problematic smartphone behaviors. For instance, Billieux et al. (2008) *demonstrated that individuals with high levels of urgency and poor impulse control tend to use smartphones more frequently and struggle to regulate their mobile phone use*. In another study, Lewin, Kaur and Meshi (2023) reported that problematic social media users may develop more impulsivity as a result of their social media use, and the researchers also pointed out that individuals who are already highly impulsive may not be able to use social media sites appropriately. Moreover, several studies have revealed positive associations between impulsivity and smartphone addiction (Billieux et al., 2007; Kim et al., 2016; Li et al., 2020; Roberts, Pullig, & Manolis, 2015). However, not every instance of phubbing can be directly attributed to problematic smartphone use. Individuals with high levels of impulsivity may also be more prone to such behavior due to underlying psychological mechanisms. For example, impulsive individuals often act without fully considering the potential consequences of their behavior or prevailing social norms (Moeller et al., 2001), which may prompt them to check their smartphones inappropriately during interpersonal interactions. Furthermore, because these individuals are highly sensitive to rewards, the immediate gratification provided by smartphones through social or informational stimuli can easily elicit impulsive responses, particularly in socially uncomfortable or boring situations (Dawe et al., 2004). Therefore, impulsivity may predispose individuals to use their smartphones uncontrollably during social interactions, ultimately giving rise to phubbing behavior.

Theoretical Framework

The theoretical basis of the present study can be explained through the I-PACE model (Brand et al., 2016, 2019), a comprehensive framework developed to understand problematic internet use. According to this model, addictive or problematic behaviors emerge from dynamic interactions between core traits (e.g., impulsivity), cognitive and affective responses to situational cues, and executive functions. For instance, a highly impulsive individual (Person) under emotional distress (Affect) may exhibit online vigilance toward their smartphone (Cognition), characterized by a persistent focus on smartphone-related cues, which may result in behaviors such as phubbing (Execution). In this context, the structural model tested in the present study examined both the direct and indirect effects of impulsivity on phubbing behavior.

Stress, the mediating variable of the study, can be conceptualized within the I-PACE framework. Impulsive individuals are more prone to experience elevated stress due to deficiencies in emotion regulation (Courtemanche et al., 2024; Hamilton et al., 2013; Seldin, Lengua, & King, 2023). Therefore, they are more likely to turn to digital media as a coping mechanism (Chiu, 2014; Van Deursen et al., 2015). Brand et al. (2016) pointed out that individuals with high stress tendencies and dysfunctional/impulsive coping strategies may use the internet to regulate their mood during stressful situations. Moreover, they stated that if a person has a belief, illusion, or cognitive bias that using the internet will relieve stress, they may be more likely to engage with their preferred online platforms. This assumption is also consistent with the Compensatory Internet Use Theory (CIUT)

(Kardefelt-Winther, 2014), which emphasizes that individuals may use digital technologies to cope with emotional difficulties, even if this leads to excessive or problematic usage over time.Online vigilance, another mediating variable in the model, refers to individuals' constant awareness of and responsiveness to online notifications and interactions. It includes both automatic stimulus-response behaviors and intentional, goal-directed actions (Reinecke et al., 2018). In this respect, online vigilance can be explained through both the I-PACE model and the Uses and Gratifications Theory (UGT), which emphasizes purposeful and goal-oriented use of digital media (Katz et al., 1973; Brand et al., 2016, 2019). Online vigilance may function as a cognitive mechanism shaped by impulsivity as a personality trait and stress as an emotional state (Brand et al., 2016, 2019). Alternatively, individuals may consciously choose to remain alert in online environments to satisfy psychological needs such as stress reduction, coping with loneliness, or overcoming boredom (Katz et al., 1973).

Building on these conceptualizations, impulsivity, perceived stress, and online vigilance can be viewed as sequential elements of a broader self-regulation process underlying phubbing behavior (Brand et al., 2016, 2019; Strack & Deutsch, 2004). Impulsivity reflects relatively stable individual differences in the capacity to regulate behavior and in sensitivity to immediate rewards (Moeller et al., 2001; Dawe et al., 2004). From this perspective, individuals with higher levels of impulsivity may be more prone to experiencing higher perceived stress when faced with everyday demands (Hamilton et al., 2013; Seldin et al., 2023). Within the I-PACE framework, perceived stress is understood as an affective state that increases the likelihood of turning to digital technologies as coping strategies (Brand et al., 2016; Kardefelt-Winther, 2014). When stress levels increase, especially among individuals high in impulsivity, attention may gradually become more oriented toward smartphone-related cues, a pattern conceptualized as online vigilance (Reinecke et al., 2018; Johannes et al., 2020). In this sense, online vigilance is better understood not as a trigger of stress, but as a cognitive response that emerges in the context of affective regulation difficulties. Stressful experiences may heighten the motivational appeal of online interactions that offer immediate psychological relief (Brand et al., 2016; Oulasvirta et al., 2012). Over time, repeated reinforcement of this attentional focus may foster habitual monitoring and rapid responses to online stimuli, thereby increasing the likelihood of phubbing during face-to-face social interactions (Schneider & Hitzfeld, 2021; Maftei & Măirean, 2024).The effect of impulsivity on phubbing can also be supported by the Dual-System Theory (Strack & Deutsch, 2004), which suggests that human behavior results from the interaction between two systems. This theory considers self-control as a conflict between impulsive and deliberate behavior. Since the impulsive system functions quickly, it may bypass conscious reasoning and lead to actions that are driven more by automatic impulses than reflective thought. As a result, individuals may shift their attention to smartphones, which offer instant gratification even during face-to-face communication. This shift in attention can impair interpersonal interaction and lead to phubbing behavior (Zahra et al., 2024).

The Mediating Role of Perceived Stress

Stress is related to the psychological reactions of individuals to the pressures and demands they face in their daily lives and for which they do not have sufficient resources to cope (Cohen, Kamarck, & Mermelstein, 1983*). The literature includes* studies *revealing* the relationship between impulsivity and stress (Ansell et al., 2012; Courtemanche et al., 2024; Hamilton et al., 2013; Seldin et al., 2023). For example, Seldin et al. (2023) stated that

persistent stress is associated with higher negative urgency and worse lack of perseverance, which are the sub-dimensions of impulsivity, while short-term stress is associated with higher negative urgency. Another study reported that individuals with higher impulsivity are more prone to daily stress exposure (Courtemanche et al., 2024). Young people under stress tend to increase their use of smartphones or internet to escape negative emotions, regulate mood, or compensate for offline social challenges (Leung, 2007). Previous research has demonstrated that individuals with higher stress levels are more inclined to use the internet as a coping mechanism, which may increase the risk of problematic internet use (Chiu, 2014; Van Deursen et al., 2015). Relying on smartphones instead of addressing the source of negative emotions may lead to problems such as smartphone addiction (Yang, Liu, & Fang, 2021; Kuang-Tsan, & Fu-Yuan, 2017; Cho, Kim, & Park, 2017; Wickord & Quaiser-Pohl, 2022). For example, Kuang-Tsan and Fu-Yuan (2017) stated that when university students encounter various life stresses, they may respond the situation with smartphone addiction, even if it is an inadequate coping mechanism. Wang et al. (2015) reported that individuals who have strong escapism and entertainment motivations for smartphone use and who experience more stress are more likely to encounter negative consequences resulting from smartphone use, compared to those who experience less stress. These findings suggest that stress plays an important role in problematic mobile phone use. Therefore, impulsive individuals who use smartphones may exhibit more phubbing behavior when under stress. Bitar et al. (2023) showed that greater anxiety and stress were associated with higher levels of phubbing.

The Mediating Role of Online Vigilance

Online vigilance is characterized by individuals' continuous attention to and involvement in online content and communication (Johannes et al., 2020; Reinecke et al., 2018). This concept arises when a person engages in other social, cognitive, or physical activities while using the online environment (Vorderer, Krömer, & Schneider, 2016). The simultaneous engagement with online content during these activities is referred to as being "permanently online", while ongoing digital interaction is known as being "permanently connected" (PO/PC) (Vorderer, Hefner, Reinecke, & Klimmt, 2018). Online vigilance reflects differences in the psychology of online media users in three aspects: Their cognitive tendencies toward online connectivity, their tendency to pay sustained attention to and respond to online notifications, and their motivational tendencies to prefer online communication to offline behavior (Reinecke et al., 2018). Reinecke et al. (2018) found that online vigilance is associated with both "relatedness need satisfaction", which is a positive variable, and "perceived stress", which is a negative variable of internet addiction, and in this respect, the researchers stated that online vigilance has both functional and dysfunctional aspects. Moreover, the researchers pointed out that online vigilance showed relatively milder results compared to the serious negative consequences of internet addiction. Responding to cues such as vibrations, rings, and reminders on mobile devices is associated with social pleasures or informative rewards (Oulasvirta et al., 2012). It has been pointed out that as a result of the learning provided by this situation, users will develop consistently high levels of attention to these stimuli (Reinecke et al., 2018).

In particular, impulsive individuals who focus on short-term rewards and satisfaction and ignore long-term consequences may become overly attentive to notifications from their smartphones in order to meet their need for psychological stimulation. This can lead to them exhibiting high online vigilance. High online vigilance

may trigger individuals' need to quickly respond to smartphone notifications. As a result, individuals may interrupt face-to-face communication and engage in phubbing. Studies have revealed that online vigilance is significantly and positively associated with Internet self-control failure and compulsive Internet use (Abraham, 2024). Furthermore, other studies have shown that online vigilance is associated with phubbing (Lv & Wang, 2023; Maftei & Măirean, 2024; Schneider & Hitzfeld, 2021).

Additionally, stress can predict online vigilance. Individuals under stress may have an increased tendency to "permanently be online" or "permanently be connected" (POPC) due to their desire to access interesting content offered by the online environment to relax, or due to their desire to follow and interact with other people online (Stieger et al., 2023; Verduyn et al., 2017; Reinecke et al., 2018). This may increase their tendency to constantly pay attention to and respond to online notifications, which may eventually heighten their motivation to prefer online communication to offline behavior. For this reason, impulsive individuals who have difficulty controlling their behavior may focus on their phones by ignoring the people around them (phubbing). Although previous research has identified associations between self-control, smartphone addiction, and phubbing behavior, few studies have focused specifically on impulsivity and its complex role in phubbing. Moreover, existing studies have rarely examined the psychological mechanisms that might explain how impulsive tendencies translate into socially disruptive digital behaviors such as phubbing. To address this gap, the present study investigates a serial mediation model based on the I-PACE framework, incorporating perceived stress and online vigilance as mediators between impulsivity and phubbing. This approach provides a more dynamic and process-oriented understanding of phubbing by examining both emotional (perceived stress) and cognitive (online vigilance) pathways that may underlie the link between personality traits and technology-related social behavior. To the best of our knowledge, no previous study has empirically tested the indirect and sequential effects of these variables within a unified structural model. In conclusion, the present study not only contributes to the phubbing literature but also extends theoretical models of problematic smartphone use and highlights the multifaceted nature of digital attention in social contexts. Accordingly, four research questions were addressed in the presented study:

(1) to test whether there is a significant relationship between impulsivity and phubbing,

(2) to test the mediating role of stress between impulsivity and phubbing,

(3) to test the mediating role of online vigilance between impulsivity and phubbing, and

(4) to test the model in which stress and online vigilance play a serial mediating role between impulsivity and phubbing.

Method

Participants

The study initially reached 427 undergraduate students from various departments of a university in Turkey in October 2023. Following preliminary analyses, the data obtained from 403 participants were retained and included in the analyses. Of the final sample, 62% were female and 38% were male students. The participants reported using the internet primarily for different purposes: 163 (40.4%) for accessing information and news, 124 (33.7%) for social media, 61 (15.1%) for watching videos, and 55 (13.6%) for messaging.

Data Collection Tools

Perceived Stress Scale

Perceived Stress Scale was developed by Cohen, Kamarck, and Mermelstein (1983) and adapted into Turkish by Eskin, Harlak, Demirkıran, and Dereboy (2013). The scale, which has two dimensions: 'Perceived Insufficient Self-Efficacy' and 'Perceived Stress/Distress', is a 14-item, 5-point Likert scale. It was designed to measure how stressful certain situations in a person's life are perceived to be. A higher score on the scale indicates a higher perception of stress.

Phubbing Scale

The scale developed by Chotpitayasunondh and Douglas (2018b) was adapted into Turkish by Göksün (2019). The Turkish version consists of 15 items rated on a 7-point Likert scale and includes four dimensions: "Nomophobia", "Interpersonal Conflict", "Self-Isolation", and "Problem Acknowledgment". A higher score on the scale indicates a higher level of phubbing behavior.

Online Vigilance Scale

The scale developed by Reinecke et al. (2018) was adapted to Turkish by Karakoyun (2021). The scale consists of three dimensions: "Salience", "Reactibility" and "Monitoring", and it includes 12 5-point Likert-type items. Getting high scores from all the items of the scale indicate that the person's online vigilance is high.

Brief Self-Control Scale

The scale developed by Tangney et al. (2004) was adapted into Turkish by Nebioğlu et al. (2012). The scale, which consists of a total of 13 5-point Likert-type items, includes the subscales "Self-Discipline" and "Impulsivity". A higher score on the scale indicates a higher level of self-control.

Although self-control and impulsivity are theoretically related constructs, the present study focused on the impulsivity subscale of the Brief Self-Control Scale, as this subscale demonstrated acceptable reliability within the current sample. The self-discipline subscale was excluded from the analyses due to its low internal consistency. This decision is consistent with methodological recommendations emphasizing the importance of reliability in scale-based research.

Data Analysis

Prior to the main analyses, the dataset was screened as part of the preliminary analyses. Univariate normality was assessed by examining the skewness and kurtosis values of all study variables, which were found to be within the acceptable range of ±2 (Kline, 2015; Hair et al., 2022). Multivariate outliers were examined using Mahalanobis distance. Five participants with z-score values exceeding the value of 3 were identified as multivariate outliers

and excluded from the dataset. Following this data screening step, the remaining data were considered appropriate for subsequent analyses. After the exclusion of these cases, the final sample consisted of 403 participants.

After completing the data screening procedures, the assumptions underlying the mediation analyses were assessed. Multicollinearity was evaluated using variance inflation factor (VIF) and tolerance values. All values fell within acceptable ranges, suggesting that multicollinearity did not pose a concern in the present analyses. Mediation analyses were performed within a structural equation modeling (SEM) framework using the R statistical environment. A serial mediation model was specified in which impulsivity served as the predictor variable, perceived stress and online vigilance were included as sequential mediators, and phubbing was modeled as the outcome variable. Indirect effects were examined using a bootstrapping procedure with 5,000 resamples, and bias-corrected 95% confidence intervals were estimated. To facilitate interpretation and comparison across model paths, standardized path coefficients (β) were reported. For the examination of the model fit indices, the criteria suggested by Browne and Cudeck (1993) and Garson (2006) were used. Accordingly, it was stated that the acceptable lower value for CFI and TLI indices was .80, good fit was between .90-.95 and perfect fit was above .95. According to the same study, an RMSEA fit index of less than .05 was considered excellent, 0.05-0.08 was good and 0.08-0.10 was acceptable. Kline (2015) also suggested the same values; in addition, an SRMR value of less than .05 was considered good and .05-.08 was acceptable, while a norm chi-square (CMIN) value below 2 was considered excellent, and less than 5 was considered acceptable. On the other hand, confidence intervals were calculated using the 5000-bootstrap method for structural equation modeling under the robust maximum likelihood estimation rules. All the analyses were conducted using JASP, a program based on R software.

Findings

Reliability of the Scales

First, after the reverse items were arranged, reliability and item analyses were conducted for the scales and their dimensions. It was found that Cronbach alpha of the Salience dimension in the Online Vigilance Scale was .844. For the same scale, the alpha value of the Monitoring dimension was calculated as .838, and the alpha value of the Reactibility dimension was .885. When Generic Scale of Phubbing was examined, it was seen that the reliability value of the Nomophobia dimension was .853, Interpersonal Conflict was .845, Self-isolation was .914, and lastly, Problem Acknowledgement was .768. The internal consistency reliability value alpha of the Perceived Insufficient Self-Efficacy dimension in the Perceived Stress Scale was .818. The alpha value of the Perceived Stress/Distress, which was another dimension of the Perceived Stress Scale, was determined as .798. When the Brief Self-Control Scale was examined, the reliability value of the Self-Discipline dimension was found to be .403, and it was found that all the item total correlations of the dimension were low. Therefore, it was seen that this dimension could not be used in the study. It is known that measurements developed in a past sample but with low reliability values in the current sample are not appropriate to use (Cortina, 1993; DeVellis, 2017; Raykov, 1997) and that these dimensions or factors can be omitted when constructing structural models (Cudeck & Browne, 1983; Kline, 2015; Nunnally & Bernstein, 1994). The reliability value of the other dimension of the Brief Self-Control Scale, Impulsivity, was calculated as .756, while the observed values of all scales were used as their dimension's total scores in the structural model stage, the items were used for Impulsivity (in the case of parceling

in the dimension consisting of 5 items, item parceling could not be done since two items would remain in one of the parcels and this parcel could not be defined; see Gorsuch, 2015; Kline, 2015).

Examination of the Measurement Model

When the measurement model (preliminary model in which confirmatory factor analyses of the scales were taken into consideration simultaneously), in which all the scales were present but regressive relationships were not defined, was examined, it was seen that data-sample compatibility was achieved, $\chi^2 = 275.262$, $df = 70$, $\chi^2/df = 3.932$, $p < .001$, RMSEA = .085, 90% CI [.075, .096], SRMR = .050, $CFI = .904$, $TLI = .875$, $GFI = .986$. The latent correlations calculated at this stage are shown in Table 1.

Table 1. Correlations between Latent Variables of the Measurement Model

	1	2	3	4
1. Phubbing	1	.758(<.001)	.649(<.001)	.284(.014)
2. Online Vigilance		1	.524(<.001)	.429(.017)
3. Impulsivity			1	.652(.013)
4. Perceived Stress				1

r(p)

Examination of the Structural Model

The mediation model in which impulsivity affects phubbing through perceived stress and vigilance series, respectively, was examined using structural equation modelling. First, all direct effects were included in the model; the direct effects from perceived stress to phubbing ($p = .182$) and from impulsivity to vigilance ($p = .226$) was found to be insignificant so that the paths were removed from the model to prevent it from suppressing the effects of other variables. When the model fit was examined for the structural model tested on the remaining paths, it was seen that acceptable results were obtained, $\chi^2 = 279.489$, $df = 72$, $\chi^2/df = 3.882$, $p < .001$, RMSEA = .085, 90% CI [.074, .095], $SRMR = .050$, $CFI = .903$, $TLI = .877$, $GFI = .985$. The model explained 75.1% of the stress variance, 35.8% of the vigilance variance, and 66.8% of the phubbing variance, as can be seen in Table 2.

Table 2. Direct and Indirect Regression Coefficients of the Structural Model

Direct Effects	B	β	SE	z	p	%95CI
Impulsivity→Stress	1.149	.866	.494	2.327	.020	0.181/2.116
Stress→Vigilance	2.133	.598	.919	2.321	.020	0.332/3.935
Vigilance→Phubbing	.743	.577	.086	8.690	<.001	.576/.911
Impulsivity→Phubbing	2.176	.356	.418	5.207	<.001	1.357/2.995
Indirect Effects						
Impulsivity→Vigilance	2.451	.298	.318	7.698	<.001	1.827/3.075
Stress→Phubbing	1.586	.344	.688	2.304	.021	.237/2.934

Impulsivity→Phubbing	1.822	.298	.293	6.218	<.001	1.247/2.396
Total Effect						
Impulsivity→Phubbing	3.997	.654	.493	8.111	<.001	3.031/4.963

B: Unstandardized regression coefficient, β: Standardized regression coefficient, SE: Standard error, CI: Confidence interval

Accordingly, an increase in the level of impulsivity ($B = 1.149$, $\beta = .866$, $p = .020$) increases the level of stress. An increase in the level of stress ($B = 2.133$, $\beta = .598$, $p = .020$) also increases the level of vigilance. Finally, it was observed that when vigilance scores ($B = .743$, $\beta = .577$, $p < .001$) increased, phubbing scores increased as well. When the model was examined, it was seen that impulsivity ($B = 2.176$, $\beta = .356$, $p < .001$) also directly increased phubbing scores. As a result, it was found that stress and vigilance had a partial mediating effect on the relationship between impulsivity and phubbing. In the model, the total standard effect of impulsivity on phubbing was found to be .654, $B = 3.997$, $p < .001$. The regression coefficients and factor loadings of the model are shown in Figure 1.
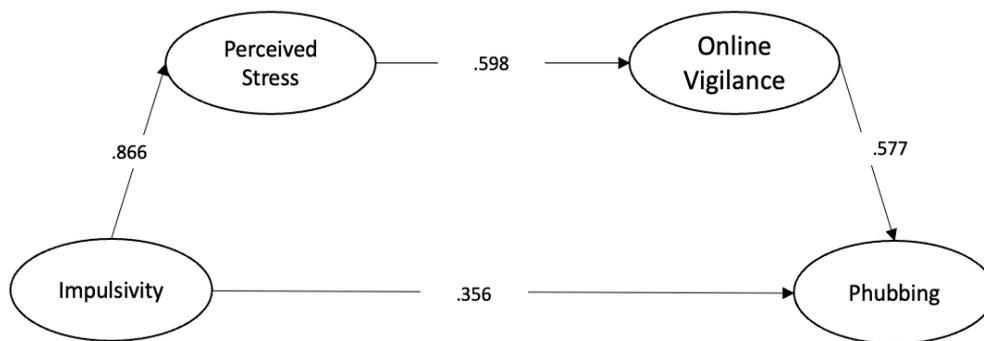

Figure 1. The Structural Model for the Serial Mediating Effect of Perceived Stress and Online Vigilance between Impulsivity and Phubbing

Discussion

The results of the study revealed significant positive associations between university students' impulsivity levels and perceived stress, online vigilance, and phubbing, indicating that higher impulsivity is associated with higher levels of these variables. In addition, impulsivity was found to be a significant predictor of phubbing behavior among university students. These findings are consistent with previous research demonstrating a close relationship between impulsivity and problematic smartphone use (Billieux et al., 2007; Kim et al., 2016; Li et al., 2020; Roberts et al., 2015). Prior studies have also shown that problematic phone use predicts phubbing behavior (Chotpitayasunondh & Douglas, 2016). Individuals who experience a heightened sense of urgency and have difficulty controlling their impulses tend to use smartphones more frequently and in a less regulated manner (Billieux et al., 2008), which may increase their likelihood of engaging in phubbing behavior. To better understand these associations, impulsivity can be examined within the multidimensional framework of the UPPS model (Whiteside & Lynam, 2001). Within this framework, the urgency dimension, defined as the tendency to act rashly

under intense emotional states, is regarded as one of the strongest predictors of problematic smartphone use (Billieux et al., 2007; Billieux et al., 2008). Individuals with high levels of urgency may turn to their smartphones as a way of rapidly alleviating negative emotions (Billieux et al., 2008). In addition, lack of perseverance, which refers to difficulty maintaining focus on a task, may lead individuals to use smartphones as a means of escaping from intrusive or distracting thoughts, thereby increasing the duration of smartphone use (Billieux et al., 2007). Another relevant dimension is lack of premeditation, which reflects a tendency to act without considering the potential negative consequences of one's behavior. Individuals high in lack of premeditation may continue to use their smartphones in social situations because they fail to take into account easily foreseeable negative outcomes, such as social disapproval or criticism (Billieux, 2012). In this context, self-control plays a critical role, as individuals with lower levels of self-control may have greater difficulty adhering to social norms and inhibiting behaviors such as phubbing, which is often perceived as socially inappropriate (Li et al., 2023).

The present findings indicate that impulsivity may influence university students' phubbing behavior through perceived stress, providing support for the Compensatory Internet Use Theory (CIUT). These findings are consistent with prior research demonstrating a robust association between impulsivity and stress (Ansell et al., 2012; Courtemanche et al., 2024; Hamilton et al., 2013; Seldin et al., 2023), as well as studies showing that higher levels of stress are associated with increased phubbing behavior (Bitar et al., 2023). Courtemanche et al. (2024) found that individuals characterized by higher levels of impulsive decision-making were found to encounter more stressful events in their daily lives. A meta-analysis by Fields et al. (2014) further revealed a moderate to strong relationship between stress and impulsive decision-making, suggesting that heightened stress increases individuals' preference for smaller but immediately available rewards. From a compensatory perspective, individuals experiencing higher levels of life stress may increasingly rely on the internet and smartphones as a means of coping, which may, over time, contribute to problematic patterns of smartphone use (Yang, Liu, & Fang, 2021; Kuang-Tsan, & Fu-Yuan, 2017; Cho, Kim, & Park, 2017; Wickord & Quaiser-Pohl, 2022). Supporting this view, Wang et al. (2015) reported that when smartphone use is motivated by stress, it may initially alleviate distress but simultaneously increase the risk of excessive use and negative outcomes. Similarly, prior research has shown that certain online activities, such as internet gaming or watching short humorous videos, can temporarily reduce stress and enhance well-being by diverting attention from offline stressors (Snodgrass et al., 2014; Stieger et al., 2023; Liu et al., 2021). However, individuals who report higher levels of escapism and entertainment motives, particularly under conditions of elevated stress, appear more vulnerable to problematic smartphone use than those experiencing lower stress levels (Wang et al., 2015). Taken together, these findings suggest that more impulsive university students may experience a stronger urge to access online content as a way of coping with stress, which in turn increases the likelihood of phubbing behavior.

At the same time, the literature also presents mixed findings regarding the links between impulsivity, stress, and phubbing. Some studies have failed to observe significant associations between stress and smartphone-related behaviors once additional regulatory factors are taken into account. For instance, Hefner and Freytag (2024) found that when mindfulness was included in the model, previously significant relationships between stress and behaviors such as automatic phone checking and multitasking disappeared. Similarly, Wang et al. (2015) reported that among individuals classified as non-problematic users, stress did not moderate the relationship between

entertainment or escapism motives and problematic smartphone use. These mixed findings suggest that the relationship between impulsivity, stress, and phubbing may be contingent on additional individual differences and contextual factors, underscoring the importance of examining these mechanisms within a broader self-regulatory framework.

The present findings also indicate that impulsivity may influence university students' phubbing behavior through online vigilance. Abraham (2024) found that the association between self-control and compulsive internet use was mediated by online vigilance and internet self-control failure. Similarly, Lv and Wang (2023) found that boredom proneness predicted phubbing through online vigilance and fear of missing out (FoMO). The authors suggested that individuals who are prone to boredom tend to exhibit heightened online vigilance as a way to satisfy their need for psychological stimulation, which in turn increases their desire to respond quickly to incoming notifications, ultimately fostering phubbing behavior. Related findings further suggest that self-control may play a limited role in restraining highly impulsive forms of online engagement. For instance, Zahrai et al. (2022) found that self-control did not significantly predict highly impulsive social media use, emphasizing that individuals with lower self-control are more strongly driven by external digital cues. In such cases, impulsive individuals may experience a strong urge to remain online or respond immediately to smartphone notifications, resulting in higher levels of online vigilance, more frequent monitoring of the online environment, and faster responses to digital stimuli. Duradoni et al. (2023) identified online vigilance as one of the strongest contributors to the variance in phubbing behavior. Individuals high in online vigilance are constantly aware of the continuous availability of online communication and content, and their motivation to remain socially connected may prompt them to disengage from offline activities and shift their attention toward the online environment, thereby increasing the likelihood of phubbing (Klimmt et al., 2017; Maftei & Măirean, 2024; Schneider & Hitzfeld, 2021).

Lastly, impulsivity appears to influence phubbing through the serial mediating effect of perceived stress and online vigilance. As discussed above, impulsive university students who experience higher levels of stress during the day may turn to their smartphones as a way of relieving this stress, particularly through entertainment and social interaction, such as following content, sharing, or communicating with others. Over time, this pattern may increase their level of online vigilance and, consequently, their likelihood of engaging in phubbing behavior. Users with high levels of reactivity who orient themselves immediately toward notifications have been shown to routinely interrupt other ongoing tasks, which may further reinforce this tendency (Mehrotra et al., 2016). Previous research has also demonstrated a positive association between active social network use and subjective well-being (Verduyn et al., 2017). In addition, Reinecke et al. (2018) reported that online vigilance was related to the satisfaction of relatedness needs and suggested that it may enhance certain positive functions of online communication, such as mood regulation or meeting relationship needs. At the same time, the authors emphasized that high levels of online vigilance may also function as a risk factor for internet addiction. Consistent with this view, several studies have shown that online vigilance is associated with both internet addiction and phubbing behavior (Reinecke et al., 2018; Maftei & Măirean, 2024; Schneider & Hitzfeld, 2021). However, increased online vigilance may not arise solely as a consequence of perceived stress; some studies have suggested that a state of continuous online vigilance may itself contribute to higher stress levels (Freytag et al., 2021; Petkovski et al., 2025; Reinecke et al., 2018).

Conclusion

The present study investigated the mediating roles of perceived stress and online vigilance in the relationship between impulsivity and phubbing behavior among university students. The results revealed that impulsivity not only has a direct effect on phubbing but also exerts significant indirect effects through both perceived stress and online vigilance, sequentially. These findings support the assumptions of the I-PACE model, which highlights the interactive roles of personality traits, emotional states, and cognitive mechanisms in the emergence of problematic digital behaviors. Furthermore, the study extends the application of this model by empirically validating a serial mediation pathway which sheds light on the psychological processes that underlie phubbing behavior.

Practical Implications

The findings of the present study have several practical implications for efforts aimed at reducing phubbing behavior and promoting healthier smartphone use among university students. When the association between impulsivity and phubbing is considered together with the role of online vigilance, it becomes important to support students in recognizing impulsive tendencies related to smartphone use, distinguishing habitual checking behaviors that occur without awareness in daily life, and regulating their attention in a more deliberate manner. At the same time, the mediating role of perceived stress suggests that phubbing should be understood not only as a habit related to technology use, but also as a process closely linked to students' emotional experiences. In this context, services offered by universities, including counseling and student support units, may help raise students' awareness of their smartphone use patterns and the potential effects of such use on social interactions. In addition, these services may assist students in regulating stress and managing everyday demands in ways that reduce the emotional pressures that fuel problematic smartphone use behaviors. By helping students develop a more conscious and intentional approach to smartphone use, such initiatives may also indirectly reduce the tendency to turn to smartphones in social situations.

Overall, the findings of this study indicate that addressing phubbing behavior among university students through single-factor explanations may be insufficient. Considering impulsive tendencies related to smartphone use, stress coping processes, and everyday attentional orientations together may contribute to a more comprehensive understanding of phubbing behavior. Interventions that adopt a holistic approach by integrating these elements may provide a more realistic and context-sensitive basis for developing practices that support healthier smartphone use and promote social engagement.

Limitations and Future Research

Several limitations should be considered when interpreting the findings of this study. First, although the sample size was relatively large, the data were collected only from undergraduate students at a single university in Turkey. This limits the extent to which the findings can be generalized to other age groups, educational levels, and cultural contexts. Future studies could therefore benefit from using more diverse samples to examine whether the observed relationships hold across different populations. Second, the cross-sectional design of the study limits conclusions

about the temporal order and causal relationships among impulsivity, perceived stress, online vigilance, and phubbing. Although mediation analyses were used to examine indirect associations among these variables, the results should be interpreted as reflecting relational and predictive patterns rather than causal processes. Accordingly, the proposed serial mediation model should be viewed as a theoretically informed explanatory framework, not as evidence of causal pathways. Future research using longitudinal or experimental designs would be useful to test causal relationships and to clarify the assumed sequence among the study variables. For example, studies conducted in naturalistic settings may provide a more detailed understanding of phubbing behaviors and their psychological consequences beyond self-report measures. Third, because the self-discipline subscale of the self-control measure showed low reliability and item–total correlations, the analyses focused only on the impulsivity subscale. While this decision helped ensure measurement reliability and conceptual clarity, it may have narrowed the scope of conclusions related to broader self-regulation processes. Future research could address this limitation by examining multiple dimensions of self-control and impulsivity together to better distinguish their unique and overlapping contributions to phubbing behavior. Despite these limitations, this study contributes meaningful insights into the psychological processes associated with phubbing by highlighting the roles of impulsivity, perceived stress, and online vigilance within a theoretically grounded framework.

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