



# Coping and Mindfulness

## Mediators Between Need Satisfaction and Generalized Problematic Internet Use

Jale Ataşalar and Aikaterini Michou

Bilkent University, Graduate School of Education, Bilkent, Ankara, Turkey

**Abstract:** Problematic Internet use (PIU) has been posited as the negative outcome of unmet psychological needs in real life. The present study, relying on the cognitive-behavioral model of PIU (Brand, Young, & Laier, 2014; Davis, 2001) and self-determination theory (Deci & Ryan, 2000), investigated the extent to which coping strategies in aversive situations and mindfulness during Internet use serve as mediating mechanisms in the relation between need satisfaction and generalized PIU (GPIU; dependency on multiple functions of the Internet). Path analysis on a sample of 165 Turkish early adolescents ( $M_{\text{age}} = 12.88$ ,  $SD = .83$ ; 49.1% females) found that need satisfaction was negatively related to PIU via low avoidant coping and high mindfulness in Internet engagement. The findings support the pathways from disadvantageous social context to GPIU suggested by Brand and colleagues' (2014) model of GPIU and additionally show that next to avoidant coping, online mindfulness, an indicator of loss of cognitive control, can be a proximal correlate of GPIU. Interventions for adolescents' harmonious Internet use could focus, among others, on adolescents' need satisfaction, awareness of coping strategies, and development of online mindfulness.

**Keywords:** need satisfaction, generalized problematic Internet use, coping, online mindfulness, early adolescents

Growing concern about adolescents' Internet use has led to an increased interest in unveiling the underlying mechanisms related to problematic versus harmonious Internet use. Research has shown that chronic frustration of the needs for autonomy (a sense of volition), competence (a sense of effectiveness), and relatedness (a sense of belongingness) in real life could lead to obsessive engagement with Internet applications such as online games (Przybylski, Rigby, & Ryan, 2010). Alternatively, need satisfaction in real life is related to less engagement in Internet activities (Shen, Liu, & Wang, 2013; Yu, Li, & Zhang, 2015) and less Internet addiction when coping is positive (Li et al., 2016). It seems that the aversive situation of unmet needs in real life could be compensated for by online activities.

This assumption is theoretically supported by the cognitive-behavioral model of pathological Internet use as initially described by Davis (2001) and further enriched by Brand, Young, and Laier (2014). Research in the framework of these models provided evidence mostly about the relation of personal dysfunctional factors to problematic Internet use (PIU) through dysfunctional coping. However, the relation of unmet needs due to an unsupportive social environment to PIU through coping has been less investigated and the aim of the present study is to contribute to this line of research.

### Need Satisfaction and Problematic Internet Use: Their Possible Mediators

According to Davis (2001), PIU can be divided into specific PIU (SPIU), dependency on a particular function of the Internet, and generalized PIU (GPIU), dependency on multiple functions of the Internet, each of which is the result of different distal and proximal causes. While SPIU is mostly the result of a preexisting psychopathology, GPIU is the result of both psychopathology and an unsupportive social context (Caplan, 2002). A less supportive social context can contribute to the development of GPIU and, therefore, we believe that unmet psychological needs in real life, such as autonomy, competence, and relatedness, can be related more to GPIU than to SPIU. Moreover, taking into account the theoretical model of Brand, Young, et al. (2014), different psychological mechanisms could mediate the relationship between the distal causes and PIU. Especially as far as GPIU is concerned, dysfunctional coping and expectancies of psychological benefits from Internet use, as well as reinforcements of the dysfunctional coping and Internet expectancies, mediate the relationship between experiences of unmet psychological needs (e.g., feelings of loneliness) and GPIU. The mediating psychological mechanisms contribute to a loss of

control in the use of the Internet, accompanied by neuropsychological operations (Brand, Young, et al., 2014).

The aforementioned theoretical model of PIU is supported by some empirical evidence. For example, Brand, Laier, and Young (2014) found that avoidant coping and Internet expectancies mediated the relationship between indicators of psychopathology (e.g., depression), dysfunctional personality (e.g., low self-esteem), and GPIU. Research also showed that Internet communication disorder, despite the fact that it is a type of SPIU (not considered the result of a pathological social context), is directly associated with social loneliness and low perceived social support without the mediation of avoidant coping (Wegmann & Brand, 2016). However, the relationship of unmet psychological needs – as the result of an unsupportive social context – to GPIU – as suggested by the theoretical model of Brand, Young, et al. (2014) – has not been investigated. Is this relationship mediated by avoidant coping?

In the present study, we rely on self-determination theory (SDT; Deci & Ryan, 2000) and we consider a low perception of need satisfaction in real life as an indicator of an unsupportive social context. From the SDT perspective, coping strategies are, among others (e.g., stress appraisals), mediators between need satisfaction and cognitive, behavioral, or emotional outcomes in stressful situations (Ntoumanis, Edmunds, & Duda, 2009). We assumed, therefore, that coping mediates the relation between need satisfaction and GPIU.

We also assumed that GPIU, as it is considered the manifestation of a loss of cognitive control (Brand, Young, et al., 2014), would be accompanied by less online self-attention and awareness (i.e., mindfulness; Weinstein & Ryan, 2011). Indeed impulsivity and low self-regulations skills, features that are related to low mindfulness, are also related to PIU (Li et al., 2013; Yu, Kim, & Hay, 2013). However, the relationship between mindfulness and PIU is underexplored (but see Gámez-Guadix & Calvete, 2016). More importantly, mindfulness has been related to more benign stress appraisals and less avoidant coping (Weinstein, Brown, & Ryan, 2009) and is considered as one of the protective factors to stress incursion as it is associated with effective stress processing (Weinstein & Ryan, 2011). For these reasons, we deemed it important to study the relation of mindfulness with GPIU while considering also the relation of mindfulness with coping and, therefore, including both coping in stressful situations and mindfulness during online activities (i.e., state mindfulness) as the mediators in the relation of need satisfaction to GPIU.

## The Present Study

The present study, relying on the cognitive-behavioral model of PIU (Brand, Young, et al., 2014; Davis, 2001)

and SDT (Deci & Ryan, 2000), investigated the relationship of social context with GPIU via coping and mindfulness during Internet use. Our study extends previous research in three ways. Firstly, we investigated the relationship of social context, instead of psychopathology or dysfunctional personality (Brand, Laier, et al., 2014), with GPIU. Secondly, we assessed not only avoidant coping but also active coping as the mediator between dysfunctional social context and GPIU. Thirdly, we considered an indicator of loss of control while being online, that is, online mindfulness, as the proximal correlate of GPIU and therefore the mediator between coping and GPIU.

Specifically, we hypothesized that adolescent need satisfaction in real life would be positively correlated with active coping and negatively correlated with avoidant coping (Hypothesis 1). We assumed also that active coping would be positively and avoidant coping negatively related to online mindfulness (Hypothesis 2) and through it to GPIU (Hypothesis 3). However, as avoidant coping and escapism have been widely related to high levels of GPIU, we did not exclude the case where avoidant coping would also be directly and positively related to GPIU. Our final hypothesis was that need satisfaction in real life would be negatively related to GPIU via coping and mindfulness in online activities (Hypothesis 4) indicating that coping and online mindfulness are important psychological mechanisms to explain the relation of need satisfaction in real life with GPIU.

## Method

### Participants and Procedure

A total of 165 students ( $M_{\text{age}} = 12.88$ ,  $SD = .83$ ; 49.1% females) from sixth to eighth grades from a Turkish urban middle school participated in the study. The study was approved by the Turkish Ministry of Education. The parents' and the principal's consent was also obtained for students' participation. Students were informed about the aim of the survey and that their participation was voluntary and anonymous. Questionnaires were administered during a class session by a researcher after getting the class instructor's permission. All students completed the survey voluntarily.

## Measures

### Need Satisfaction

A Basic Need Satisfaction Scale (Deci & Ryan, 2000), translated into Turkish by Bacanlı and Cihangir-Cankaya (2003), was used to assess participants' basic need satisfaction in

**Table 1.** Descriptive and bivariate correlations of the measured variables

Variables	1	2	3	4	5	6	7	8	9	10
Psychological needs										
1. Need for autonomy	–									
2. Need for competence	.61**	–								
3. Need for relatedness	.58**	.59**								
Coping										
4. Seeking support	.25**	.17*	.32**	–						
5. Problem-solving	.18*	.28**	.24**	.56**	–					
6. Avoidant	–.17*	–.16*	–.05	.19*	.32**	–				
During Internet use										
7. Mindfulness	.17*	.21**	.02	–.07	.02	–.33**	–			
Problematic Internet use										
8. Excessive use	–.20*	–.13	.01	.06	–.01	.26**	–.48**	–		
9. Social benefit	–.31**	–.25**	–.17*	–.12	.04	.37**	–.43**	.40**	–	
10. Negative consequences	–.22**	–.19*	–.07	.02	–.06	.37**	–.59**	.72**	.48**	–
MS	3.83	3.68	3.97	2.21	2.34	1.97	4.03	3.17	2.02	2.03
SD	0.73	0.72	0.70	0.52	0.45	0.39	0.84	0.84	0.87	0.75

Note. \* $p < .05$ . \*\* $p < .01$ .

their real lives, on a 5-point Likert-type scale. Seven items assessed *autonomy* (e.g., “I generally feel free to express my ideas and opinions”;  $\alpha = .60$ ), six items *competence* (e.g., “People I know tell me I am good at what I do”;  $\alpha = .60$ ), and eight items *relatedness* (e.g., “I really like the people I interact with”;  $\alpha = .73$ ).

### Coping Strategies

A Coping Strategies Scale developed by Amirkhan (1990) and translated into Turkish by Aysan (1994) was used. The scale consisted of 11 items for *problem-solving* (e.g., “Tried to solve the problem”;  $\alpha = .84$ ), 11 items for *seeking support* (e.g., “Went to a friend for advice on how to change the situation”;  $\alpha = .86$ ), and 11 items for *avoidance* (e.g., “Avoided being with people in general”;  $\alpha = .71$ ). Responses were indicated on a 3-point Likert-type scale (1 = *never*, 3 = *always*).

### Mindfulness

Six out of the 15 items of the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003) were adapted and translated into Turkish to assess participants’ mindfulness during Internet use (e.g., “I did activities on the net in a rush without paying attention to what they really are”), on a 5-point Likert-type scale. Principal component analysis extracted one factor when one item was excluded ( $\Lambda = 2.28$  and explained variance 45.61%) and therefore, we computed a composite score for mindfulness during Internet use by aggregating the five items ( $\alpha = .69$ ).

### General Problematic Internet use

The Turkish Problematic Internet Use Scale for Adolescents (PIU-A; Ceyhan & Ceyhan, 2009) was adapted to assess

participants’ PIU, on a 5-point Likert-type scale. The instrument included three subscales: *negative consequences* of Internet use (14 items; e.g., “I am neglecting my daily job [like doing homework, exercise or taking a shower] to spend more time on the Internet.”;  $\alpha = .87$ ); *excessive use* (6 items; e.g., “When I use the Internet till the late hours, I sleep less than ever.”;  $\alpha = .69$ ); and *social benefit/social comfort* (7 items; e.g., “People in my real life do not respect me as much as people on the net”;  $\alpha = .77$ ).

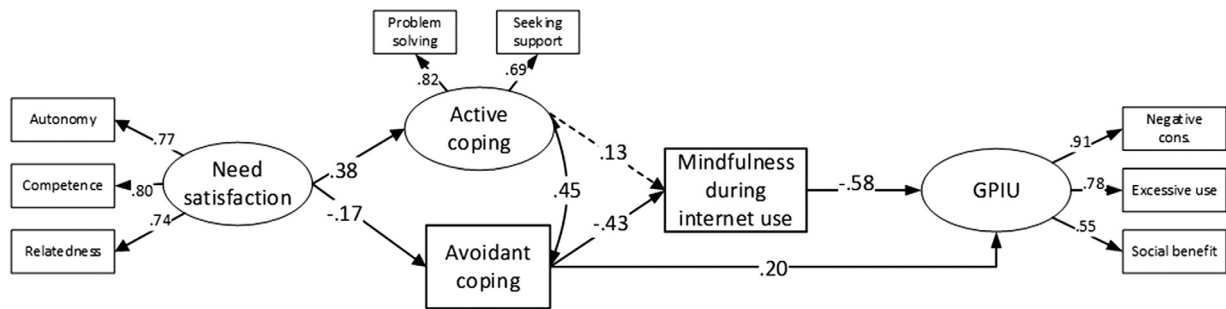
## Results

### Preliminary Analysis

Descriptive statistics and bivariate correlations are presented in Table 1. A multivariate analysis of variance (MANOVA) showed no significant gender differences (Wilk’s  $\Lambda = .912$ ,  $F[10, 154] = 1.48$ ,  $p = .15$ , multivariate  $\eta^2 = .09$ ).

### Main Analysis

We performed path analysis using the EQS 6.1 structural equation modeling software package (Bentler, 1995) to investigate the mediation of coping and online mindfulness in the relation of need satisfaction to GPIU. Avoidance coping and online mindfulness were represented by the mean score of the measured variable. Need satisfaction was defined by the mean of *autonomy*, *competence*, and *relatedness* satisfaction as these three subscales were



**Figure 1.** The tested model controlling for gender differences (not shown for sake of clarity). The dashed line represents a statistically nonsignificant path.

strongly and positively correlated ( $r = .58-.61$ ). Accordingly, active coping was defined by the mean of *problem-solving* and *seeking support* ( $r = .56$ ), while GPIU by the mean of *excessive use*, *social comfort*, and *negative consequences* ( $r = .40-.72$ ). We deemed it important to use the mean of those subscales that were strongly and positively correlated so as to construct a simple model where the important relationships would be highlighted.

Inspection of Figure 1 shows that most of the hypothesized paths were significant and fit indices were acceptable, CFI = .920, SRMR = .075, RMSEA = .084 (90% CI = .058–.109), although the expected variance-covariance matrix,  $S-B\chi^2(37, N = 165) = 79.82, p < .01$ . Specifically, after controlling for gender differences (not shown in Figure 1), need satisfaction was positively related to active coping and negatively related to avoidant coping, confirming Hypothesis 1. In the sequel, avoidant coping was negatively related to online mindfulness, partially confirming Hypothesis 2 as active coping was not related to online mindfulness. Avoidant coping was also directly and positively related to GPIU, while online mindfulness was negatively related to GPIU. A test of indirect effects showed that mindfulness during Internet use partially mediated the relation between avoidant coping and PIU ( $B = 0.41, SE = .10, z = 4.35, \beta = .25, p < .01$ ; Hypothesis 3) suggesting that low avoidant coping was associated with low GPIU when online mindfulness was high.

As active coping failed to relate to online mindfulness, we tested a supplementary model with social support and problem-solving being separately represented so as to explore if any of the adaptive strategies related positively to online mindfulness. The fit indices of the supplementary model were acceptable:  $S-B\chi^2(33, N = 165) = 73.49, p < .01$ , CFI = .924, SRMR = .076, RMSEA = .086 (90% CI = .060–.112). The path from problem-solving to mindfulness was significant ( $\beta = .22, p < .01$ ) as were all the other hypothesized paths. A test of indirect effects showed that online mindfulness mediated the negative relation between problem-solving and GPIU ( $B = -0.18, SE = .08,$

$z = -2.30, \beta = -.13, p < .01$ ) suggesting that high problem solving was associated with low GPIU when online mindfulness was also high.

Finally, concordant with Hypothesis 4, a test of indirect effects showed that need satisfaction was positively associated with online mindfulness through avoidant coping ( $B = 0.18, SE = .10, z = 2.25, \beta = .12, p < .01$ ), suggesting that the more students satisfied their needs the more likely they were to report mindfulness during Internet use as a result of low avoidant coping. A similar test of indirect effects further showed that need satisfaction was negatively related to GPIU ( $B = -0.12, SE = .05, z = -2.28, \beta = -.11, p < .01$ ) by means of low avoidant coping and high online mindfulness.

## Discussion

In the present study, following the theoretical models of PIU (Brand, Young, et al., 2014; Davis, 2001), we investigated the relationship between perceptions of social context – as manifested in need satisfaction in real life – and GPIU, by considering coping strategies as the mediating mechanism. In particular, we included both active and avoidant coping as mediators of social context to GPIU, trying to show pathways to harmonious Internet use as well. We also tested mindfulness during online engagement, an indicator of loss of cognitive control, as the mediator between coping and GPIU, extending further the existing research on the models of PIU.

The findings showed that need satisfaction in real life was positively and negatively related to active and avoidant coping, respectively, supporting Hypothesis 1 as well as theoretical models of PIU (Brand, Young, et al., 2014) and well-being (e.g., Ntoumanis et al., 2009; Weinstein & Ryan, 2011). It seems that when adolescents have a sense of being effective, are able to choose freely, and are connected to others in their real life, they use active coping strategies such as problem-solving or seeking social support. By contrast, when they experience less need satisfaction in real life,

they use avoidant coping strategies such as self-blaming, wishful thinking, or ignoring problems to a greater extent.

Moreover, avoidant coping was negatively related to online mindfulness indicating that when adolescents use more avoidant coping strategies, they are not fully aware of their present environment or themselves, and do things online in an automatic mode. This result supports the model of PIU (Brand, Young, et al., 2014), according to which a positive reinforcement of the avoidant coping during Internet use results in a loss of cognitive control. Research has shown that many Internet applications provide need satisfaction while being online (Peng, Lin, Pfeiffer, & Winn, 2012; Przybylski et al., 2010). This experience of online need satisfaction can be considered the positive reinforcement that strengthens the use of an avoidant coping strategy and therefore the loss of cognitive control.

Interestingly, active coping was not related to online mindfulness, as was initially hypothesized in the present study. It seems that not all the adaptive coping strategies are related to mindfulness during Internet use. Weinstein et al. (2009) found approach coping consisting of active coping, acceptance, positive reinterpretation, and growth to be positively related to university students' mindfulness. However, in our study active coping consisting of both social support and problem-solving strategies failed to relate positively to online mindfulness. Supplementary analysis, in which social support and problem-solving were represented separately, showed that, while social support did not relate to online mindfulness, problem solving was positively related to online mindfulness and, through it, negatively related to GPIU. This finding suggests a pathway to harmonious Internet use with high problem-solving and high online mindfulness as the mediators between need satisfaction and less GPIU. Future research could clarify the relationship of various functional coping strategies to online mindfulness so as to better describe possible pathways to harmonious Internet use.

The findings of the present study, concordant with Hypothesis 3, showed that lower levels of mindfulness during Internet use partially mediated the relationship between increased avoidant coping and GPIU, while avoidant coping was also directly and positively related to GPIU. This shows that a weakened cognitive control can be related to GPIU but the urge to avoid a stressful situation can also be directly related to GPIU. This can justify the generalized use of Internet applications in a pathological manner. Any application can be chosen if it distracts from a stressful situation. Further research could clarify if such a direct relation exists also between avoidant coping and SPIU when indicators of loss of cognitive control are also considered. As gratification is the main cause of loss of control in SPIU, online mindfulness could fully mediate between coping and SPIU.

More interestingly, this study showed that need satisfaction in early adolescents' real life was positively related to GPIU through high avoidant coping and low online mindfulness. This finding supports Hypothesis 4 and has considerable implications for designing interventions for prevention of GPIU.

Our findings suggest that adolescents' need satisfaction and awareness of how avoidant and active coping strategies affect an individual's well-being can be addressed by preventive programs that deal with GPIU. Our findings also suggest that mindfulness during online activities is one of the correlates of harmonious Internet use. The literature reveals that the implementation in school settings of mindfulness-based practices is associated with increased resilience and mitigated risk factors (Guedner & Feuerborn, 2016); and, enhanced attentional and emotional self-regulation and coping capacity (Meiklejohn et al., 2012). Therefore, conducting intervention designs in schools aimed at increasing the online mindfulness of young adolescents may contribute to decreasing GPIU.

The study has some limitations, however. Firstly, as the data were collected using self-reports, the responses of early adolescents, even though anonymous, might be affected by social desirability. Secondly, the cross-sectional research design does not establish any causal relationship between the variables, namely, needs satisfaction, coping strategies, online mindfulness, and GPIU. Thirdly, the Cronbach alpha value of need for autonomy and need for competence was relatively low. Finally, the sample was relatively small and the participants were recruited from one middle school in an urban area of Turkey; further research is needed with a bigger sample coming from different areas of Turkey as well as from other countries.

## Conclusion

In conclusion, the current study expands our understanding of the psychological mechanisms related to GPIU in early adolescence. Specifically, the findings suggest that early adolescents' avoidant coping strategies and low online mindfulness mediate the negative relation between need satisfaction in real life and GPIU.

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#### Jale Atasölar

Bilkent University  
Graduate School of Education  
06800 Bilkent, Ankara  
Turkey  
atasalar@bilkent.edu.tr



Jale Atasölar is a PhD candidate in Curriculum and Instruction at the Graduate School of Education, Bilkent University, Turkey. She is a graduate of the Psychological Counseling and Guidance Department (BSc and MA) at Hacettepe University. Her research interests include problematic Internet use, social and emotional development of adolescents, and family therapy.



Aikaterini Michou, BSc (Hons) University of Athens, MA University of Geneva, PhD University of Athens, is Assistant Professor in the Department of Educational Sciences at Bilkent University, Turkey. Her research interest pertains to the contextual and personal factors that determine learners' motivation and in turn their functioning and well-being.