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Research Paper

The Link between Different Types of Smartphone Use and Iranian EFL Learners' Emotional-behavioral Functioning

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Abstract

Although smartphones are commonly used as a tool for both language learning and entertainment, there is a lack of research into how different types of smartphone use affect emotional and behavioral problems. To investigate this, a random sample of EFL (English as a foreign language) students in North Khorasan, Iran, was given four scales of the Achenbach questionnaire, including anxiety/depression, thought problems, delinquent behaviors, and aggressive behavior, as well as a newly developed scale for assessing the type of smartphone use, namely academic and entertainment. The results of descriptive statistics, ANOVA, and Regression showed that the more time foreign language learners spent using smartphones, the more likely they were to experience emotional and behavioral problems. Additionally, using smartphones primarily for entertainment was a positive predictor of emotional and behavioral problems, while academic use was negatively associated with these issues. The study suggests that the best way to use smartphones for language learning depends on various individual, classroom, and contextual factors that need to be taken into account. Students should be informed of the benefits of using smartphones as a language learning tool and be aware of the potential risks that may arise from excessive and addictive use without a learning objective.

Keywords:
Mobile phone use, academic use, entertainment, mental-behavioral functioning

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Introduction

The use of smartphones in educational contexts has been bourgeoning in recent years all over the world, not only outside the classroom but also during classroom instruction (Ebadi & Raygan, 2023; Eskandari et al., 2023). The widespread use of smartphones in educational settings has been justified on the grounds that these user-friendly devices can enhance students' cognitive, emotional, and behavioral engagement because of their multitude of functions and capacities in connection with the internet (Stokols, 2018). Given that almost all school students own this device and use it either for language learning or entertainment purposes, it seems an immediate necessity to make L2 learners aware of the benefits, varied uses, and even the potential risks associated with the use of smartphones so that L2 learners can integrate this amazing device into their academic and school repertoire in a useful and motivated way (Yaman et al., 2015). Nevertheless, smartphones coupled with the Internet can provide a wide range of tempting targets capable of distracting students from their instructional activities(Bjerre-Nielsen et al., 2020). According to Eskandari et al. (2023), mobile phones can potentially affect human life in general and students' lives in particular both positively and negatively, depending greatly on the usage context (Orben & Przybylski, 2019), and also the time spent on smartphones (Busch & McCarthy, 2021).

In a recent study by Yang et al. (2023), it was found that problematic use of smartphones (e.g. excessive or addictive use) can negatively affect the users' sense of control via the mediation experiential avoidance. That is, excessive use of smartphones may be an avoidance strategy to escape from an aversive and upsetting emotion or situation. Further, it was found that participants who had a less clear self-concept compared with participants who had a clear self-concept were more prone to be affected by excessive smartphone use negatively. Using cognitive emotion regulation strategies (CERS) as the mediating factor, Hasani et al. (2024) found that some aspects of one's personality (e.g. neuroticism) can lead to Internet Use Disorder. Taken together, the findings of prior research (Bjerre-Nielsen et al., 2020; Cheng et al., 2018; Reid Chassiakos et al., 2016; Twenge et al., 2018) suggest that problematic phone use is associated with a wide array of psychological and behavioral problems such as hyperactivity, impaired physical health, narcissistic tendencies, perceived stress, compromised sleep quality, and depression and anxiety. However, the extant literature suggests that the usage context and the type of use (Eskandari et al., 2023; Orben & Przybylski, 2019) may bring about distinct effects on smartphone users, especially in an educational context. To the best of our knowledge, there has been no study whose purpose has been to examine the effect of the distinct uses of smartphones, namely academic and entertainment on second language learners' emotional-behavioral problems. To address this research gap, first, we developed a researcher-made scale for assessing academic and

entertainment aspects of smartphone use, and also their overall time spent on smartphone use; second, four sub-scales of The Achenbach Child Behavior Checklist (CBCL) (Achenbach, 1991), including Anxious/Depressed, Thought Problems, Attention Problems, Delinquent Behavior, and Aggressive Behavior were administered to a sample of Iranian EFL students. The main purpose of this study was to understand what type of smartphone use and how much use is considered problematic in the context of learning a foreign language. It is worth noting that successful acquisition of a second language is dependent on the optimal use of technology including smartphones (Yaman et al., 2015). Thus, the current study aims to provide answers to the following research questions:

1. Is the smartphone use scale developed in this study reliable?
2. Is the smartphone use scale developed in this study valid?
3. Is the overall time spent daily on smartphone use related to emotional behavioral problems?
4. Is the academic use of smartphones related to emotional-behavioral problems?
5. Is the entertainment use of smartphones related to emotional-behavioral problems?

Literature review

The utilization of mobile phones by students has been discovered to exert an influence on their emotional-behavioral functioning, a finding that has garnered considerable attention in academic circles. The employment of cyberspace, encompassing an assortment of technological devices such as smartphones, tablets, gaming consoles, and social networking platforms, has been correlated with an array of emotional and behavioral predicaments, including but not limited to anxiety, depression, withdrawal, somatic complaints, social quandaries, thought problems, attentional deficits, antisocial conduct, and aggressive behavior, as elucidated in a study conducted by Eskandari, Vahdani, and Khodabandelou (2023). Furthermore, it has been discerned that excessive reliance on mobile phones and the development of mobile addiction can exert an adverse influence on academic behavior, whereas the judicious utilization of mobile phones has been shown to have a positive impact on academic performance among students pursuing higher education, as posited by Fook and Narasuman (2022). Furthermore, an extended duration of mobile phone usage has been associated with the manifestation of physical, psychological, and behavioral issues, which encompass alterations in visual acuity, discomfort in the wrist and neck regions, compromised concentration, and an augmented propensity to employ abbreviations in everyday communication, as highlighted by Grewal, Bajaj, and Sood (2020). Moreover, it is imperative to acknowledge that excessive dependence on mobile phones among students can also engender detrimental consequences on their social functioning, as expounded upon by (Eskandari et al., 2023).

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Mobile phone use has been found to have various effects on students' emotional and behavioral functioning. Problematic smartphone use among college students has been associated with behavioral, attitudinal, and psychological tendencies, highlighting the need to consider contextual cues and situational factors in understanding the outcomes of smartphone use and abuse (Dai et al., 2021). Neuroticism is positively related to mobile phone use, while self-emotional assessment and love status play mediating and moderating roles in this relationship among college students (Chen et al., 2022). Problematic mobile phone use has been associated with impaired mental health, impaired parent and school relationships, and more behavioral problems in adolescents, suggesting the importance of addressing this issue, especially in adolescents with behavioral or emotional problems (Roser et al., 2016). Students' decisions to engage with their cell phones during class are influenced by their attitudes toward using these devices, which are shaped by their instructors' teaching behaviors and experiences of boredom in class (Bolkan & Griffin, 2017).

Method

Participants

The study was conducted on Iranian high school students from North Khorasan who were studying English as a foreign language. The participants were selected through cluster sampling, which involved randomly selecting several intact high schools and English classes as naturally occurring units in the province. The sample consisted of 406 students, 208 girls (51.2%) and 198 boys (48.8%), aged between 16 and 18 years. While Cochran's formula suggested a sample size of 400, 600 questionnaires were distributed to ensure an adequate sample size. The first author attended the classes in person and then stayed there to receive the completed questionnaires. A total of 470 questionnaires were completed and collected after initial screening. After entering the questionnaire data into SPSS software, 64 questionnaires were excluded from the study due to incomplete responses or random patterns of answering. The participants orally agreed to take part in the study, and a few students who did not like to participate were not given the questionnaires.

Instruments

Smartphone Use Scale

In the current study, we designed a new Smartphone Use scale to be used specifically for English students based on the literature on the use of smartphones in educational settings (Eskandari et al., 2023). Developing a specialized scale for English language learners is necessary since different forms of technology play a key role in the language learning process (Ebadi et al., 2022). The smartphone Use scale consists of two sub-scales, namely Academic use comprising five items, and Entertainment use consisting of three items. Each item is responded on a 5-point Likert-type scale from 1 (strongly disagree) to 5 (strongly agree). Academic use (*I use my smartphone to use English interactively through*

AI apps, WhatsApp, etc.) measures the extent to which L2 learners use their phones for language learning purposes, while the Entertainment sub-scale (*I use my smartphone to follow funny and other non-academic content in different social media like Instagram*) measures the extent to which L2 learners use their phones for having fun, and other non-academic purposes. To ensure that the newly designed scale was reliable and valid, we did not include any negatively worded items and focused mainly on positive wording (Soleimanzadeh et al., 2023). Before using this new scale, we tested them on a small sample of 85 high school students in Bojnord, who were selected based on their availability. We ensured the comprehensibility of new items and confirmed their construct validity via preliminary confirmatory factor analysis CFA before collecting large-scale data.

Achenbach System of Empirically Based Assessment (ASEBA)

ASEBA is a big battery of questionnaires that are widely used for measuring child and adolescent emotional-behavioral functioning. Since its development by Thomas Achenbach in 1960, this comprehensive questionnaire has been extensively used in different educational and clinical settings by clinicians, teachers, and researchers (Achenbach & Rescorla, 2014). This multidimensional questionnaire can provide different pieces of information regarding participants' internalizing and externalizing problems. In the current study, we used four sub-scales of Anxiety/Depression (*I am Unhappy, sad, and depressed*), Thought Problems (*I am impulsive or act without thinking*), behaviors such as Delinquent behavior (*I am used to Lying and cheating*), and Aggressive Behavior (*Reports acts of cruelty, bullying or meanness to others including siblings*). Each item is responded on a 4-point Likert-type scale from 0 (strongly disagree) to 4 (strongly agree).

Data Collection

Before conducting the research, we obtained written permission from the University Research Affairs and the General Department of Education of North Khorasan Province to distribute the questionnaire among high school students. Then, we visited the schools and classes defined in the sample to distribute the questionnaire. We explained to the students that the data collection process was anonymous and their information would remain confidential. On average, we were present in the classes for approximately forty minutes to allow the students to answer the questions, and at the end, we collected the completed questionnaires. The students were also informed of the voluntary nature of the research and they were free to withdraw if they wanted.

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Data analysis

The collected data were inputted into the Statistical Package for Social Sciences (SPSS 26) to perform descriptive statistics and exploratory factor analysis (EFA). Additionally, Analysis of Moment Structure (AMOS 24) was utilized to conduct confirmatory factor analysis (CFA). Descriptive statistics, as explained by Mackey and Gass, (2015) were utilized to provide a concise overview of the data collected. This technique aided in analyzing the demographics of the participants. The measures of central tendency such as mean, and standard deviation, as well as measures of distribution such as skewness, kurtosis, and Cronbach's alpha, were computed. Additionally, data screening and cleaning processes were used to identify any outliers and missing information. Then, we performed an exploratory factor analysis to investigate the underlying factor structure of the smartphone use scale. Having run this EFA, we performed a confirmatory factor analysis to verify whether the results of CFA are consistent with the factors obtained from EFA.

Results

Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multi-collinearity, and homoscedasticity. We used a $p < .001$ criterion for Mahalanobis distance to identify outliers. Overall, we had to remove 14 cases as outliers at this stage. Table 1. displays the descriptive statistics such as mean, SD, variance, and the reliability of the scales used in the current study.

Table.1

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance	R
Time	403	1.00	3.00	2.1811	.76584	.587	
Academic use	382	5.00	25.00	15.1675	3.87714	15.032	
Entertainment use	392	3.00	15.00	11.0179	3.07738	9.470	
Anxious/ Depressed	375	12.00	30.00	18.0213	4.13665	17.112	
Thought problems	375	12.00	32.00	17.7840	4.14945	17.218	
Delinquent Behavior	381	8.00	21.00	11.3517	2.79797	7.829	
Aggressive Behavior	373	15.00	39.00	21.7802	5.04495	25.452	
Valid N (listwise)	290						

Note: Time: Hours spent on smartphone per day

To examine the construct validity of the newly developed scales for assessing the type of smartphone use, initially, we performed an EFA to investigate the underlying factor structure. We used Maximum likelihood estimator and varimax rotation for this EFA analysis. The obtained values of Kaiser-Meyer-Olkin (KMO) and Bartlett's Tests of Sphericity

indicated that the data is suitable for factor analysis. In this case, the result of KMO was .72 which shows the sampling was adequate for finding common factors. The significant results of Bartlett's Tests of Sphericity for perfectionism scale ($X^2 = 455.22$, df = 28, $p < .05$) showed that the correlation matrix was not identity matrix and therefore they are suitable for structure detection. EFA analysis resulted in the extraction of two factors which explained 51% of the variance of the scale (see Table 5 below). These two factors were consistent with the two types of smartphone use. However, it should be noted that at first, we had designed 9 items, but we had to remove three items because of factor loadings below .40.

Table2.

The Results of the Factor Analysis of the Type of Smartphone Use Questionnaire

Item	Component 1	Component 2
I use Smartphone to		
1. …do language learning activities such as listening to podcast.	.72	
2. … discuss language-related subjects with my classmates.	.73	
4. … find some complementary English materials.	.64	
5. … get help from my English teachers for language-related	.67	
8. … use English in an interactive way (e.g. AI apps, Telegram etc.).	.59	
3. …play online and offline games.		.78
6. … listen to music.		.77
7. … follow funny and entertaining content in social media.		.74
Eigenvalue	30.05	52.24
Percentage of explained variance	28.65	52.24

In the next stage, we used confirmatory factor analysis to check the construct validity of the newly developed scale for assessing smartphone use with two sub-scales, namely academic use (three items) and entertainment use (four items). The model showed a good fit to the data ($X^2 = 31.05$, df = 13, CMIN/df = 2.38, GFI = .98, CFI = .96, TLI = .94, and RMSEA = .059) and the factor loadings of the items ranged from .57 to .68 (see Figure 1).

Figure 1

Measurement Model of Type of Smartphone Use

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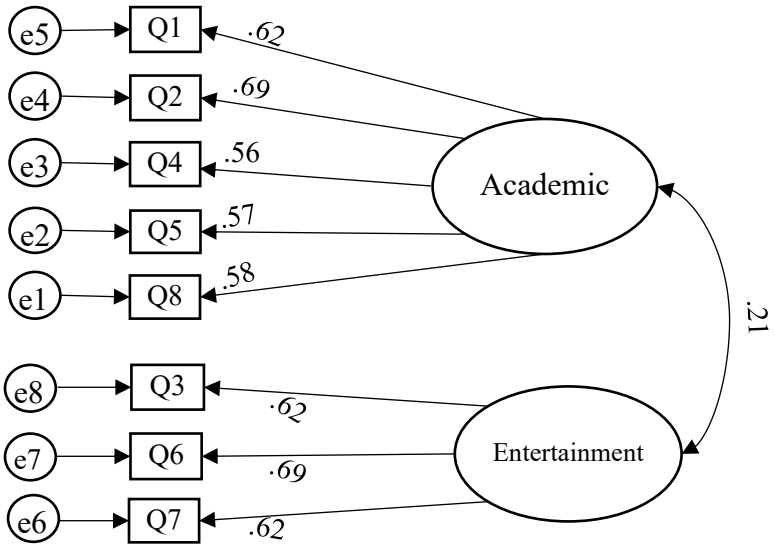

The relationship between the independent variables including (time spent in the virtual environment, academic use, and entertainment use) and the four dependent variables, namely anxiety/depression, thought problems, delinquent behavior, and aggressive behavior were assessed using Pearson product-moment correlation coefficient. In keeping with the prior research, the four emotional-behavioral problems were positively correlated with entertainment use in a virtual environment, and negatively associated with academic use (see Table 3). Considering the overall time spent in the virtual environment irrespective of the type of use, the correlation analysis indicated that the more time spent in the virtual environment, the L2 learners were more likely to experience emotional-behavioral problems.

Table 3. Correlations among the dependent and independent variables

	1	2	3	4	5	6
Time						
Academic	-.02					
Entertainment	.32**	.1*				
Anxiety/Depression	.15**	-.04	.23**			
Thought Problems	.25**	-.13**	.24**	.6**		
Delinquent Behavior	.27**	-.12*	.16**	.31**	.59**	
Aggressive Behavior	.28**	-.19**	.25**	.56**	.72**	.68**

* p< .05.
*** p<.001.

A one-way between-groups analysis of variance was performed to examine the impact of time spent on using smartphones on different aspects of emotional-behavioral functioning including Anxiety/Depression, Thought Problems, Delinquent Behaviors, and Aggressive Behavior. L2 learners who participated in this study were divided into three groups according to the hours spending on their smartphones daily (Group 1: 1-2 hours; Group 2: 2 to 3 hours; Group 3: 3 hours and above). As shown in Table 4, a statistically significant difference was found at the $p < .05$ level in the four dependent variables among the three groups of participants. Despite gaining statistical significance, the difference between the three groups in mean scores of Anxiety/Depression was quite small as indicated by its effect size which was calculated using eta squared (.024).

The values of effect size for Thought problems, Delinquent behavior, and Aggressive Behavior were rather large based on Cohen's (1988, pp. 284–7) terms, suggesting .01 as a small effect, .06 as a medium effect, and .14 as a large effect. Post-hoc comparisons between the three groups as calculated by Tukey HSD test indicated that the L2 learners who had spent more than three hours on using their smartphones (Group 3) scored significantly higher in all the dependent variables compared to the other two groups. However, group one and group two were not statistically different.

Table 4.

The results of One-Way Analysis of Variance to Compare the Time and Type of Smartphone Use and the Components of Achenbach

		Sum of Squares	df	Mean Square	F	Sig.	Eta Square
Anxious Depressed	Between Groups	154.18	2	77.09	4.6	.011	
	Within Groups	6209.28	371	16.73			.024
	Total	6363.47	373				
Thought problems	Between Groups	417.32	2	208.66	12.91	.000	
	Within Groups	5978.36	370	16.15			.07
	Total	6395.68	372				
Delinquent Behavior	Between Groups	257.46	2	128.73	18.25	.000	.1
	Within Groups	2658.75	377	7.05			
	Total	2916.22	379				
Aggressive Behavior	Between Groups	759.67	2	379.83	16.18	.000	.08
	Within Groups	8662.2	369	23.47			
	Total	9421.87	371				

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The first regression model that was run for Anxiety/depression as the dependent variable, R for regression was statistically different from zero, F (2, 341) = 10.55, p < .001, with R^2 value of .06 indicating that 6% of the variability in anxiety is accounted for by Entertainment use of smartphone (beta = .24, p < .001). The academic use of smartphone was not significantly related to L2 learners' anxiety level. In the next model, we entered Thought-Problems as the dependent variable, with Academic and Entertainment uses of smartphones as two independent variables accounting for 8% of the variance in the dependent variable F (2, 341) = 15.18, p < .001). In this mode, Entertainment use of smartphone recorded a higher (and also a positive) beta value (beta = .34, p < .001) than the Academic use (beta = -.17, p < .001). The third model showed that the two independent variable could explain only 5% of the Delinquent Behavior F (2, 348) = 8.28, p < .001), with Entertainment use having a higher and also a positive beta value (beta = .18, p < .001), than Academic use (beta = -.14, p < .007). The final model indicated that the two independent variables were the strongest predictor of Aggressive Behavior F (2, 342) = 22.64, p < .001), when compared to other emotional-behavioral problems mentioned in the first three model. In the last model, the two independent variables as a whole could explain 12% of the variance in Aggressive Behavior, with Entertainment use having a higher and also a positive beta value (beta = .28, p < .001), than Academic use (beta = -.22, p < .007).

Discussion

The current study investigated the relationship between smartphone use and different aspects of emotional-behavioral problems as assessed by the Achenbach scale (Achenbach, 1991). The findings from our sample of EFL learners in Iranian high schools showed a significant positive association between the time spent on smartphones and four aspects of emotional-behavioral problems. Moreover, it was found that only the entertainment use of smartphones by L2 learners was positively associated with these emotional-behavioral problems, whereas the use of smartphones for language learning purposes was negatively associated with these emotional-behavioral problems. These findings in the context of language learning replicate what has already been found in other educational and non-educational contexts (Chen et al., 2022; Hasani et al., 2024; Yang et al., 2023). The positive association between time spent on smartphones, especially the entertainment uses of phones, and emotional-behavioral problems can be explained in terms of L2 learners' sense of control (see Yang et al., 2023). People are basically motivated to have or at least perceive high control over their lives and circumstances (Ryan & Deci, 2002), and when they think that they do not have such control, they tend to compensate for this lack of control by excessive or problematic use of smartphone (Brailovskaia & Margraf, 2022). Particularly, the excessive use of smartphones is a form

of experiential avoidance to escape from upsetting and disturbing thoughts, providing momentary relief but it can result in serious social and psychological functioning in the long term (Jiaxin et al., 2020). The overuse of avoidant coping strategies like problematic use of smartphones (Emadi Chashmi et al., 2023; Liu et al., 2023) can lead to internalizing distress (Akbari et al., 2022) and even compulsive behaviors through the process of externalizing problems (Den Ouden et al., 2020). As Yang et al. (2023) rightly argue, the problematic use of smartphones provides students with immediate relief from distressing and unwanted emotions and thus acts as an accessible means for escaping from unpleasant experiences of home and school. However, it should be borne in mind that we should not expect a simple causal link between smartphone use and emotional-behavioral disorders since there are a wide range of mediating and moderating factors that affect this relationship (Liu et al., 2023). For example, in a recent study by Hasani et al. (2024), it was found that internet use disorder was to some extent predicted by individuals' personality traits. Specifically, the results of their study indicated that only neuroticism was positively related to internet use disorder, while agreeableness, openness to experience, and consciousness were negatively related.

The significant relationship between excessive use of smartphones (e.g. entertainment use) and the four emotional-behavioral problems in this study can also be explained in terms of what some researchers call "Fear of Missing Out" (FoMO) (Akbari et al., 2022; Milyavskaya et al., 2018). FoMO is defined as an apprehension that you might miss out on some pleasant and rewarding experiences that other people might experience, leading to a feeling of being left behind or lagging behind causing people to feel anxious and depressed (Przybylski et al., 2013). It should be noted at this junction that FoMO itself may vary as a function of some other personality factors such as perfectionism (Barabadi et al., 2022; Brauer et al., 2023) and its associated side effect of "not mattering" (Casale & Flett, 2020). This argument suggests that when L2 learners do not feel like they matter in the classroom or even at home by their teachers, classmates, and parents, they might seek other entertaining ways of mattering and importance through excessive use of smartphones. Regarding the impact of FoMO on the problematic use of smartphones and the internet, Benzi et al. (2023) suggested that individuals with higher levels of FoMO are more prone to problematic smartphone use because these people tend to develop an impaired trust perspective, leading them to experience Mistrust and Credulity, both of which can increase the risk of addiction to technology and the internet.

The negative association between the academic use of smartphones for language learning and emotional-behavioral problems confirms the prior research findings pointing out that when L2 learners have positive attitudes towards smartphones, they can easily integrate this technology into their language learning process (Ebadi & Raygan, 2023). The learners' attitudes toward the use of smartphones as a language learning device is to a large extent dependent on the facilitating conditions that determine the behavioral intentions of language learners, concerning the actual use of this device in a meaningful

way (García Botero et al., 2018; Hoi, 2020). Therefore, it can be argued that the beneficial and healthy use of smartphones in education and language learning classrooms is incumbent on some factors: the facilitating conditions, the perceived use of smartphones, and L2 learners' attitudes towards its usefulness (Ebadi & Raygan, 2023), students' awareness of different applications and uses of smartphones (Yaman et al., 2015), and also raising students' awareness that the naïve use of technology including smartphones can bring about numerous emotional-behavioral problems (Eskandari et al., 2023). Therefore, teachers and parents, school staff, and other stakeholders must provide a supportive environment (Barabadi & Razmjoo, 2015) so that the students can appreciate and reap the benefits of smartphones for language learning purposes. The results of several studies (Barabadi & Razmjoo, 2016) suggest that one of the main challenges of L2 learners in Iran especially students who learn English in public schools is that they are not autonomous enough, suggesting that Iranian L2 learners' language learning experiences are mainly limited to classroom environments. Therefore, language teachers need to become aware of how to adopt different forms of technology both in their teaching and also in helping their students adopt technology (e.g. smartphones) in an effective way for the language learning process (Fathi & Ebadi, 2020). Finally, as mentioned before, parents and teachers should be cognizant of the children and students' emotional, psychological, and mental states, traits, and propensities since the usefulness or detrimental effect of smartphones may vary as a function of perfectionism and emotions (Barabadi & Khajavy, 2020), their playfulness (Barabadi et al., 2022), cognitive rumination tendencies (Barabadi et al., 2022), and mattering and motivation (Chasetareh et al., 2022). For example, it is more likely that a student who is suffering from a negative form of perfectionism, or perfectionistic cognitions to get involved in the problematic use of smartphones because these individuals have an inner compulsion, telling them that they might miss out on something pleasurable and enjoyable in the virtual environment (e.g. smartphones), and this temptation may result in addictive use of smartphones (Milyavskaya et al., 2018), whose outcome is nothing just intensifying the emotional-behavioral problems of its users.

Conclusion

The findings of this study shed light on the link between the amount of time spent on smartphone use as well as the type of use and four indices of emotional-behavioral problems including anxiety/depression, delinquency, thought problems, and aggressive behavior. The results indicate that the more time L2 learners spend on their phones, they are more likely to experience these four kinds of emotional-behavioral problems. However, it was also found that only the entertainment use of smartphones was positively associated with these emotional-behavioral problems. That is, the academic use of smartphones for language learning purposes should not be considered problematic use of smartphones if used optimally. In light of these findings, it was argued that smartphone

addiction may be a form of experiential avoidance or a kind of negative coping strategy used by students who think that they do not have a sense of control over their life circumstances, and hence they take refuge in the virtual environments in a problematic manner. Further, it was argued that L2 learners need scaffolding and constant support in the form of awareness of the different uses and benefits, and applications of smartphones for language learning purposes so that they can use this device effectively. It might seem to be a preposterous suggestion but if students are allowed to use their smartphones even during classroom instruction with the guided support of their teachers, they are more likely to develop a healthy and positive attitude toward the use of smartphones. Finally, it should be noted that the results of our study and our arguments should be presented with caution since we did not directly include some relevant moderating and mediating variables like personality factors, classroom climate, and other contextual variables into account. Future research is needed to see under what conditions and for which group of students, the use of smartphones might be healthy or problematic.

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