Computers in Human Behavior 103 (2020) 208–213

Contents lists available at ScienceDirect

Computers in Human Behavior

journal homepage: http://www.elsevier.com/locate/comphumbeh

Full length article

Too good to be cautious: High implicit self-esteem predicts self-reported dangerous mobile phone use

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ARTICLE INFO

Keywords:
Mobile phone
Driving
Self-esteem
Implicit
Explicit
Risk assessment

ABSTRACT

Mobile phone use and misuse have become a pressing challenge in today's society. Dangerous mobile phone use, such as the use of a mobile phone while driving, is widely practiced, though banned in several jurisdictions. Research aiming at unfolding the psychological predictors of dangerous mobile phone use have so far been scarce. Especially, researchers have never taken the role of self-esteem into account, which is unfortunate given prior research linking self-esteem to addictive mobile phone use. In the present study, we evaluated the associations between both explicit and implicit self-esteem and dangerous mobile phone use, with a particular focus on phoning while driving. To do so, we assessed implicit self-esteem among 95 participants (89 females) via the Implicit Association Test and explicit self-esteem via a self-reported measure. Problematic mobile phone use and demographic data were assessed with self-reported measures. Implicit self-esteem predicted dangerous mobile phone use, even after we controlled for demographic data and mobile phone dependence. Explicit self-esteem, however, was related to neither dependence nor dangerous use of the mobile phone, thereby supporting the importance of distinguishing between explicit and implicit self-esteem. Our results set the scene for new research avenues regarding mobile phone use while driving.

1. Introduction

Mobile phone use has seen a worldwide increase over the two last decades. Along with the blossoming research about the influence of mobile communication in human behaviors, a continually growing number of studies have shown some beneficial impacts of mobile use, such as communication optimization (Geser, 2004) and the development of mobile-based applications to improve mental and physical health (Blake, 2008; Fjeldsoe, Marshall, & Miller, 2009; Khazaal, Favrod, Sort, Borgeat, & Bouchard, 2018; see also; Heeren, 2018). On the other hand, mobile phone use may also yield adverse consequences (for comprehensive reviews, see Billieux, 2012; Billieux et al., 2015a). Adverse consequences include addiction-like symptoms (Bianchi & Phillips, 2005; Long et al., 2016), mobile phone-mediated antisocial behaviors (e.g., "phubbing": snubbing someone in a social setting by concentrating on one's phone instead of talking to the person directly; Chotpitayasunondh & Douglas, 2016), cyberbullying (Nicol & Fleming, 2010), and adolescent sexting (De Graaf, Verbeek, Van den Borne, & Meijer, 2018).

On top of that, one of the most challenging issues in contemporary research is the dangerous use of the mobile phone, which mainly encompasses its use while driving (Collet, Guillot, & Petit, 2010; Ortiz,

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https://doi.org/10.1016/j.chb.2019.09.018
Received 11 June 2019; Received in revised form 28 August 2019; Accepted 21 September 2019
Available online 24 September 2019

Ortiz-Peregrina, Castro, Casares-López, & Salas, 2018; Oviedo-Trespalacios, King, Haque, & Washington, 2017). Indeed, between 60% and 85% of individuals used their mobile phone while driving and almost 40% of drivers considered this habit a non-dangerous activity (for a review, see Lipovac, Đerić, Tešić, Andrić, & Marić, 2017). However, driver distraction is responsible for about 25% of car crashes (Lipovac et al., 2017). Accordingly, laboratory studies have shown that mobile phone use affects numerous aspects of driving performance, such as attentional and psychomotor abilities (e.g., Svenson & Patten, 2005), which, in turn, strongly increase the risk of car crashes (Collet et al., 2010). Likewise, texting when driving has become a key predictor of car accidents, as it negatively affects attention (e.g., maintaining vigilance) and monitoring (e.g., maintaining a consistent speed, responding to traffic events) abilities (Caird, Johnston, Willness, Asbridge, & Steel, 2014). Nonetheless, although a few studies have unraveled positive associations between dangerous mobile phone use and various sociodemographic factors, including being a male (Billieux, Van der Linden, & Rochat, 2008; Lipovac et al., 2017), young (Brusque & Alauzet, 2008), and highly educated (Márquez, Cantillo, & Arellana, 2015), uncertainty still abounds regarding the mechanisms that trigger such use, especially while driving.

To date, one of the most common explanations of mobile phone use while driving focuses on personality traits. Personality dispositions, such as heightened sensation-seeking traits (Billieux et al., 2008), a tendency to have low self-control, high impulsivity (Hayashi, Rivera, Modico, Foreman, & Wirth, 2017), or compromised delay discounting (Hayashi, Russo, & Wirth, 2015), are related to phoning while driving. Yet, despite increasing research linking personality dispositions and dangerous mobile phone use, none has focused on self-esteem, which comes as a surprise given prior research bridging self-esteem to actual and problematic mobile phone use.

Self-esteem is defined as the way an individual evaluates him- or herself (Leary & Baumeister, 2000) and can be assessed both explicitly and implicitly. Explicit self-esteem is measured by self-reported questionnaires that ask people how satisfied they are with themselves. Although self-reported measures are informative about explicit cognitions, scholars have argued that they have limited sensitivity for identifying individual differences (Greenwald & Farnham, 2000). Moreover, they are likely to yield evaluation bias (Bosson, Swann, & Pennebaker, 2000). In contrast, implicit self-esteem is assessed with indirect measures in order to understand the automatic and unconscious nature of self-esteem. The Implicit Association Test (IAT) is currently one of the most commonly used research tools to capture implicit cognitions (e.g., Bar-Anan & Nosek, 2014; Rochat, Maurage, Heeren, & Billieux, 2019). It relies on categorization between a target concept (e.g., me, others) and an attribute (e.g., positive, negative) and provides an index of the strength of the implicit association on the basis of response latencies (Greenwald, McGhee, & Schwartz, 1998). Current research underlines the importance of combining explicit and implicit measures, which may reflect distinct concepts (Bosson et al., 2000; Rochat et al., 2019).

Of note, prior research has highlighted the role of self-esteem vis-à-vis mobile phone use. First, individuals with low self-esteem prefer indirect communication to face-to-face communication. Second, low self-esteem is a strong predictor of problematic behaviors (Billieux, 2012). Indeed, low self-esteem is associated with increased problematic mobile phone use, although inconsistently, with small-to-medium effect sizes and mainly with explicit measures (for a review, see De-Sola Gutiérrez, Rodríguez de Fonseca, & Rubio, 2016). Nevertheless, to date, no research has directly explored the links between self-esteem and dangerous mobile phone use, which is unfortunate, as mobile phone use while driving has been frequently observed among individuals with high driving confidence (Struckman-Johnson, Gaster, Struckman-Johnson, Johnson, & May-Shinagle, 2015) and high education levels (Márquez et al., 2015). This observation hence brings into question the involvement of low self-esteem. Indeed, low self-esteem is related to addictive use of the mobile phone, but it is likely that self-esteem plays a different role in relation to dangerous use, for example, with higher levels relating to risky driving. Such a view aligns with studies suggesting that high self-esteem is associated with violence or risky behaviors (e.g., high self-esteem individuals seem to be particularly confident that they would win a fight and are therefore more willing to engage in it; Baumeister, Smart, & Boden, 1996).

Given the literature outlined above, the present study aimed at revealing the relations between, on the one hand, explicit and implicit self-esteem and, on the other hand, dangerous mobile phone use, with a particular focus on phoning while driving. To this purpose, we used both explicit and implicit measures of self-esteem and capitalized on a validated self-reported questionnaire to assess problematic use of the mobile phone (Billieux et al., 2008) in order to best capture dangerous use.

2. Method

2.1. Participants

We recruited 95 French-speaking volunteers (89 women, 93.7%) who owned a mobile phone. Participants were between 18 and 42 years old ($M = 22.09$, $SD = 3.57$) and 63.2% of them had a driver's license. All participants included in the study had answered at least one item of the subscale that measured dangerous mobile phone use. Participants were recruited from the community via media and listserv advertisements inviting people to participate in the study. The study was conducted in 2008[1] and followed the principles of the Declaration of Helsinki. Informed consent was obtained from all participants in the study.

2.2. Procedure

Participants first performed the IAT (Greenwald et al., 1998). The task was programmed and presented by using E-Prime 2 Professional (Psychology Software Tools, Pittsburgh, PA, USA). Participants then filled in the self-reported measures in paper form, including demographic information, explicit self-esteem (the Rosenberg Self-Esteem Scale [RSE]; Rosenberg, 1965), and mobile phone use (Problematic Mobile Phone Use Questionnaire [PMPUQ]; Billieux et al., 2008). We used the validated French version of these scales (RSE: Vallière & Vallerand, 1990; PMPUQ: Billieux et al., 2008). To avoid a carryover effect (i.e., the possible effect of one measure on the following ones), we counterbalanced the order of completion of the self-reported measurement tools across participants.

2.3. Measures

2.3.1. Implicit self-esteem

The IAT (Greenwald et al., 1998) was used to assess implicit self-esteem. This measure constitutes a widely used test (Bar-Anan & Nosek, 2014), particularly adapted to measure constructs such as self-esteem (Greenwald & Banaji, 1995). The IAT is a computerized task that assesses the strength of the association between two concepts, in this case "me/other" and "positive/negative." The score is based on latencies to classify stimuli that appear in the center of the screen into one of the two target categories: "me" (e.g., *I, me, mine, my-self, my*) or "other" (e.g., *they, other, them, their, him*) and/or into one of the two attribute categories: "positive" (e.g., *beauty, success, peace, family*[2]) or "negative" (e.g., *death, pain, prison, poverty*[3]). The name of the categories appeared at the upper right or left of the screen. In order to assign stimuli to the correct category, participants were instructed to press the "E" key

[1] This project was initiated in the context of a master thesis conducted at the University of Geneva. Because this project was not part of a PhD or a funded research program, its finalization and publication has been delayed until 2018.

[2] French translation: beauté, succès, paix, famille.

[3] French translation: mort, douleur, prison, pauvreté.

for the category presented in the upper right corner of the screen and the "I" key for the category presented in the upper left corner of the screen. The IAT used in the current study consisted of five blocks: Blocks 1, 2, and 4 were practice blocks and thus not taken into account in the final score. Block 3 was a congruent block, meaning that the target category "me" shared the response key with the "positive" attribute (both presented in the upper left corner of the screen), whereas the target category "other" shared the response key with the "negative" attribute (both presented in the upper right corner of the screen). Block 5 was an incongruent block, in which the category "me" shared the response key with the "negative" attribute (upper left corner of the screen), and the category "other" shared the response key with the "positive" attribute (upper right corner of the screen). Faster correct responses in the congruent block than in the incongruent one indicate that participants more strongly associate positive than negative stimuli to the self (i.e., high implicit self-esteem). IAT scores were computed from the scoring algorithm proposed by Greenwald, Nosek, and Banaji (2003), a validated procedure presenting robust psychometric properties compared to traditional methods (e.g., Back, Schmukle, & Egloff, 2005). Error responses were discarded. Responses of lower than 300 ms were replaced by 300 ms and responses of higher that 3000 ms were replaced by 3000 ms. The average response times of Block 5 were subtracted from the average response times of Block 3. The resulting score was divided by the standard deviation of all correct response times in Blocks 3 and 5. The reliability of the IAT has been supported by a good split-half internal consistency ($r = .69$; Bosson et al., 2000) and a good test-retest reliability (median $r = .56$; for a review, see Nosek, Greenwald, & Banaji, 2007). In the current study, we also found good reliability coefficients (i.e., correlation between the two experimental blocks: $r = .75$, $p < .001$ and correlations between trials: all $rs > 0.49$, all $ps < .001$; Rosenthal & Rosnow, 1991).

2.3.2. Explicit self-esteem

The RSE (Rosenberg, 1965) is the most commonly used tools to assess self-esteem (e.g., Donnellan, Ackerman, & Brecheen, 2016). This scale is a 10-item self-report questionnaire that assesses the cognitive and affective facets of explicit self-esteem (e.g., "On the whole, I am satisfied with myself"). Participants answered each item on a four-point Likert scale, higher scores indicating higher self-esteem. In this study, we used the French version of the RSE (Vallière & Vallerand, 1990), which has good internal consistency ($\alpha = .89$) as well as good test-retest reliability ($r = .85$). In the current sample, the reliability of the RSE was supported by reliability coefficients (i.e., correlations between each item and the total score: all $rs > 0.50$, all $p < .001$) and a good internal reliability, with a Cronbach's alpha of .85.

2.3.3. Problematic mobile phone use

The PMPUQ (Billieux et al., 2008) is a comprehensive measure of mobile phone use, widely employed (e.g., Kuss et al., 2018), and including specific items to assess dangerous use. This scale is a 30-item self-report questionnaire that evaluates mobile phone use through four dimensions of potential misuse (i.e., dangerous use, prohibited use, dependence, and financial problems). In the current study, the dangerous use subscale (e.g., "While driving, I find myself in dangerous situations because of my mobile phone use") was the main dependent variable, whereas the dependence subscale (e.g., "I get irritated when I am forced to turn my mobile phone off") was used as a control variable in the model. The dangerous use subscale is based on five items, the first being a general question and the other four concerning phoning while driving. One item therefore assesses unspecific dangerous mobile phone use ("I use my mobile phone in situations that would qualify as dangerous"). The two other subscales of the PMPUQ (i.e., prohibited use and financial problems) were not used for the current study. For each item, participants were asked to respond on a four-point Likert scale, higher scores indicating higher levels of mobile phone misuse. The PMPUQ has good psychometric properties, including good structural validity and internal reliability (with a Cronbach's alpha of .73 for dangerous use score and of .84 for the dependence score; Billieux et al., 2008). The current study aligns with those observations, with Cronbach's alpha of .70 for dangerous use score and of .82 for the dependence score. Likewise, the correlations between the four factors (all $rs > .27$, all $ps < .01$) as well as of those factors with the total score (all $rs > .59$, all $ps < .001$) were significant and medium-to-large.

Prior to completing the PMPUQ, all participants were asked to answer several general questions regarding their mobile phone use; i.e., how long had they owned a mobile phone (1 = "less than one year," 2 = "from 1 to 5 years," 3 = "more than 5 years"), how many phone calls did they make per day (1 = "from 0 to 2 calls," 2 = "from 3 to 5 calls," 3 = "more than 5 calls"), how much time did they spend on the phone per day (1 = "from 0 to 10 min," 2 = "from 10 to 30 min," 3 = "more than 30 min"), and how many text messages did they send per day (1 = "from 0 to 3 SMS," 2 = "from 4 to 10 SMS," 3 = "more than 10 SMS").

3. Results

3.1. Correlation analyses

An initial correlation matrix is provided in Table 1. We used the Benjamini–Hochberg false-discovery procedure (Benjamini & Hochberg, 1995) to hold the expected proportion of falsely rejected null hypothesis at 5% for the 45 correlations we computed. A few significant pairwise correlations stood out after applying this correction: dangerous mobile phone use was positively associated with the number of daily calls made ($r = .39$), the duration of daily calls ($r = .30$) as well as implicit self-esteem ($r = .31$). Other significant relationships were observed between variables related to actual and problematic mobile phone use (see Table 1 for details).

3.2. Regression analyses

We computed a hierarchical linear model to predict dangerous mobile phone use from the demographic variables in Step 1 (sex and age), variables related to the actual use of the mobile phone in Step 2 (the number of years the participants had a mobile phone, the number of phone calls per day, the duration of phone calls, and the number of text messages sent per day), mobile phone dependence in Step 3 (the dependence dimension of the PMPUQ, used as a control variable), and explicit and implicit self-esteem in Step 4. The full model (see Table 2) accounted for 32% of the variance in dangerous mobile phone use ($R^2 = .03$, .24, .25, and .32 for Steps 1 to 4, respectively). In the first step, no significant predictor was found. In the second step, age ($B = .25$, $p = .011$) and number of daily calls made ($B = .34$, $p = .003$) were observed as significant predictors. In the third step, mobile phone dependence did not significantly predict dangerous use ($B = .06$, $p = .591$) after we controlled for demographic variables and variables related to actual mobile phone use. In the last step, whereas explicit self-esteem did not predict mobile phone use while driving ($B = -.15$, $p = .121$), implicit self-esteem did ($B = .26$, $p = .007$) over and above demographic data, actual use, and mobile phone dependence (Table 2).

4. Discussion

The main aim of this study was to examine the relationship between dangerous mobile phone use, the most representative example being phoning while driving, and both explicit and implicit self-esteem. Younger age, an elevated number of daily calls made, and high implicit self-esteem emerged as significant predictors of dangerous mobile phone use. Notably, these relations remained after we controlled for demographic data, actual mobile phone use, and mobile phone dependence.

Perhaps the most striking finding was the observation that high

Table 1
Summary of first-order correlations among the study variables.

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Sex	–	–	–	–	–	–	–	–	–
2. Age	−0.05	–	–	–	–	–	–	–	–
3. MP-Years	0.11	0.11	–	–	–	–	–	–	–
4. MP-Daily Calls	0.12	−0.11	0.21	–	–	–	–	–	–
5. MP-Daily Duration	0.05	−0.24	0.21	0.55*	–	–	–	–	–
6. MP-SMS	0.17	−0.21	0.13	0.41*	0.57*	–	–	–	–
7. PMPUQ-Dependence	0.09	−0.26	0.14	0.37*	0.52*	0.41*	–	–	–
8. PMPUQ-Dangerous use	−0.09	0.17	0.06	0.39*	0.30*	0.19	0.18	–	–
9. RSE	0.01	0.09	0.17	−0.02	−0.17	−0.27	−0.14	−0.15	–
10. IAT-SE	0.05	−0.07	0.16	0.24	0.19	0.24	0.10	.31*	0.07

Note. * Correlations were significant at $p < .05$, corrected for multiple correlations by using the false discovery procedure (Benjamini–Hochberg procedure). Sex (1 = female, 2 = male); MP-Years = numbers of years of mobile phone ownership; MP-Daily Calls = daily calls made with the mobile phone; MP-Daily Duration = daily duration of calls made with the mobile phone; MP-SMS = number of text messages sent daily; PMPUQ-Dependence = Problematic Mobile Phone Use Questionnaire – Dependence subscale; PMPUQ-Dangerous use = Problematic Mobile Phone Use Questionnaire – Dangerous use subscale; RSE-SE = Rosenberg Self-Esteem Scale; IAT-SE = Implicit Association Test – Self Esteem (D score; Greenwald et al., 2003).

Table 2
Hierarchical linear model predicting dangerous use of the mobile phone (i.e., PMPUQ score, mobile phone while driving) from demographic variables (sex and age), actual use of mobile phone variables (number of years participant has had a mobile phone, number of calls made per day, mean duration of calls made, and number of text messages sent per day), dependence on mobile phone, explicit self-esteem, and implicit self-esteem.

Predictor	B	*SE* (B)	β	R^2
Step 1				.03
Intercept	1.71	0.16		
Sex	−0.25	0.33	−0.08	
Age	0.06	0.02	0.16	
Step 2				.24***
Intercept	1.78	0.15		
Sex	−0.40	0.30	−0.12	
Age	0.06	0.02	0.25*	
Number of years participant has had mobile phone	−0.14	0.20	−0.07	
Number of calls made per day	0.39	0.13	0.34**	
Mean duration of calls	0.18	0.14	0.17	
Number of text messages sent per day	0.05	0.14	0.04	
Step 3				.25**
Intercept	1.78	0.15		
Sex	−0.40	0.31	−0.13	
Age	0.06	0.02	0.26*	
Number of years participant has had mobile phone	−0.15	0.20	−0.07	
Number of calls made per day	0.39	0.13	0.34**	
Mean duration of calls	0.16	0.14	0.15	
Number of text messages sent per day	0.04	0.15	0.03	
Dependence on mobile phone	0.08	0.15	0.06	
Step 4				.32***
Intercept	1.77	0.15		
Sex	−0.38	0.29	−0.12	
Age	0.06	0.02	0.27**	
Number of years participant has had mobile phone	−0.15	0.20	−0.07	
Number of calls made per day	0.36	0.13	0.31**	
Mean duration of calls	0.14	0.14	0.13	
Number of text messages sent per day	−0.07	0.15	−0.05	
Dependence on mobile phone	0.09	0.14	0.07	
Explicit self-esteem	−0.25	0.16	−0.15	
Implicit self-esteem	1.22	0.44	0.26**	
Total R^2				.33

Note. PUMPUQ = Problematic Mobile Phone Use Questionnaire.
*$p < .05$.
***$p < .01$.
***$p < .001$.

implicit self-esteem predicts dangerous mobile phone use. Given previous findings linking problematic mobile phone use (especially addictive use) to lower levels of explicit self-esteem (Bianchi & Phillips, 2005; De-Sola Gutiérrez et al., 2016; Elhai, Dvorak, Levine, & Hall, 2017), our findings may appear at odds with prior research. However, these results should not come as a surprise.

First, although prior research has suggested that low self-esteem may trigger excessive mobile phone use via a "reassurance pathway," whereby the need to maintain relationships and obtain reassurance from others drives mobile phone (over)use (Billieux et al., 2015a,b; Wang et al., 2018), individuals using mobile phone while driving have been identified as exhibiting high self-confidence (Struckman-Johnson et al., 2015). Therefore, it is not surprising that high implicit self-esteem is at play in the present study. Especially, one cannot exclude a functionally distinct role of high versus low self-esteem in problematic mobile phone use — that is, a differential function between people who use a mobile phone while driving and those who excessively use their mobile phone. This perspective strongly aligns with Baumeister and colleagues' proposal (1996) that individuals with high self-esteem are more prone to engaging in dangerous behaviors (e.g., they may tend to think that they can manage the double task of phoning and driving).

Second, our findings dovetail with previous studies pointing out the role of high self-esteem in risky behaviors, although most earlier works relied on explicit measures of self-esteem (i.e., the RSE and the Single-Item Self-Esteem Scale). For instance, high self-esteem has been associated with extreme physical activity (Ertl et al., 2018), alcohol use among college students (İnandi et al., 2009), stronger commitment in Facebook groups (Lo Coco et al., 2018), and specific patterns of video game involvement (Billieux et al., 2015c). Likewise, individuals with high self-esteem make more risky choices during decision-making tasks, especially in loss situations (Zhang, Chen, Gao, Liu, & Liu, 2018). From a conceptual perspective, explicit and implicit self-esteem are considered to be related yet distinct constructs (Gawronski & Bodenhausen, 2006), with explicit self-esteem referring to propositional processes (i.e., conscious evaluations and beliefs) and implicit self-esteem to associative processes (i.e., activated beyond subjective truth or falsity). In the current study, the distinct nature of these processes has been supported by the tools used (De Houwer & Moors, 2012): for explicit evaluation, participants were asked to assess how they consider themselves; on the other hand, for implicit evaluation, participants were not directly instructed to make associations between the self and the concepts proposed (positive and negative). Accordingly, high explicit self-esteem refers to an intentional positive self-evaluation, whereas high implicit self-esteem reflects spontaneous associations between the self and positive thoughts (Gawronski & Bodenhausen, 2006; Koole & Dehart, 2007). Considering both explicit and implicit evaluations, a specific association between implicit self-esteem and dangerous mobile phone use was observed, whereas explicit self-esteem was not related to any variables after the Benjamini–Hochberg correction. This observation thus reinforces the idea that explicit and implicit measures of self-esteem tap into distinct and non-isomorphic psychological constructs (Bosson

et al., 2000; Zhao, Yu, Zhang, & Ren, 2017). Moreover, it also suggests that mobile phone use while driving may be better predicted by automatic affective reactions toward the self than by conscious propositional self-evaluation processes. These results raise the likelihood that the underlying constructs that have the potential to explain this relationship are not conscious or directly accessible. Future studies should thus further investigate the possible role of high self-esteem in risky behaviors by using both explicit and implicit self-esteem measurements.

In follow-up research, several issues require further examination. First, an important limitation is the cross-sectional nature of the data, precluding strong inferences regarding the cause-effect relationships among the variables (Maurage, Heeren, & Pesenti, 2013). To best capture the causal and temporal relationships between self-esteem and dangerous mobile phone use, longitudinal and experimental methods are warranted. Second, our study was not preregistered and participants were relatively young and predominantly female. Preregistered replications, including a better-balanced gender-ratio and age-distribution, are thus clearly needed to examine whether the relations between self-esteem and dangerous mobile phone use differ across gender and age. Third, the study was conducted in Switzerland. Future studies should thus extend this investigation in different countries, particularly in countries where using the mobile phone while driving is a predominant behavior or where driving licenses can be obtained at younger ages (e.g., 16 years old), such as in the United States (Centers for Disease Control and Prevention, 2013). Fourth, although sample sizes like those of the present study are usually not regarded as small in this research field, a simulation study has revealed that a sample of about 250 participants is usually considered as adequate to achieve stable estimates for correlations (Schönbrodt & Perugini, 2013). However, a power analysis (setting the level of α at 0.05, power $[1 - \beta]$ at 0.80) based upon previous correlational studies linking self-esteem and mobile phone use (Hong, Chiu, & Huang, 2012; Walsh, White, Cox, & Young, 2011) indicated that a total sample size of at least 84 participants yields enough power to detect small-to-medium effect sizes ($r = .30$) in the present study. Fifth, although the present study focuses on self-esteem and dangerous mobile phone use among individuals with a mobile phone and driving experience, we did not quantify the latter construct (e.g., number of kilometers per day, average time spent in traffic jams). This issue is particularly important given that some of our participants did not hold a definitive driver's license. Future studies should thus further take driving characteristics into account. Finally, we mainly focused on mobile phone use while driving. However, many researchers have suggested that the study of dangerous mobile phone use can transcend driving and be extended to other situations (e.g., phoning while involved in climbing, phoning while cooking).

5. Conclusion

This study evaluates the role of self-esteem in dangerous mobile phone use beyond the recognized involvement of self-esteem in addictive use of a mobile phone. These results show that high implicit self-esteem predicts dangerous mobile phone use, and this association remains after controlling for sociodemographic data, actual use of the mobile phone, and dependence symptoms.

Declarations of interest

None.

Role of the funding source

None.

Acknowledgment

We would like to thank Christine Mauron-Pillonel for her help in data collection.

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