



Social media addiction and burnout: The mediating roles of envy and social media use anxiety

Chang Liu¹ · Jianling Ma²

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Abstract

Although prior studies have to some extent clarified the mechanism underlying the development of social media burnout, the present study contributes to the literature by showing how social media addiction contributes to this phenomenon. Chinese university students ($N = 519$) completed self-report questionnaires on social media addiction, social media burnout, envy, and social media use anxiety. The results showed that addiction, envy, and social media use anxiety were all significant predictors of burnout. Moreover, envy and social media use anxiety mediated the relationship between social media addiction and burnout, both in parallel and as a pair in series. Considering the negative effect of social media burnout such as depression, the findings may provide new path to understand the detrimental of excessive use of social media toward corresponding psychological outcomes.

Keywords Social media · Burnout · Addiction · Anxiety · Envy · Social comparison

Introduction

With the rapid development of information and telecommunications technology, modern social media such as Facebook, Twitter, and Instagram have already revolutionized peoples' ways of contacting and communicating with one another. Numerous studies have already provided evidence that social media have brought benefits to their users with respect to their psychological well-being, such as improvements in self-esteem and quality of life. It is not surprising that social media play an indispensable role in many people's lives today.

However, excessive use of social media also has invisible and potentially detrimental effects, such as poor sleep quality (Garett et al. 2018; Xanidis and Brignell 2016; Woods and Scott 2016; Tian et al. 2016; Levenson et al. 2016; Adams and Kislner 2013), lower subjective happiness (Satici and Uysal 2016;

Pittman and Reich 2016; de Vries and Kühne 2015; Uysal et al. 2013; Utz and Beukeboom 2011), a decline in academic performance (Sobaih et al. 2016; Alt 2015; Junco 2012), and undesirable emotional consequences, such as anxiety and depression (Seabrook et al. 2016). The present study contributes to this area of research by showing that excessive use of social media leads to social media burnout, and by elucidating the mediating roles of envy and social media use anxiety in this relationship. Understanding and resolving the issue of social media fatigue or burnout is of vital importance since there are evidence that social media burnout is associated with negative psychological well-being such as depression and anxiety (Dhir et al. 2018). Moreover, for any social media company aiming to achieve rapid growth in the present environment of increasingly fierce competition, alleviating the burnout symptom and attract more users may benefits the organization itself.

Excessive Use of Social Media and Burnout

Although Facebook and other social media platforms have gained in popularity worldwide and the number of social media users is still growing rapidly overall, there is also a phenomenon known as social media fatigue (Shin and Shin 2016; Lee et al. 2016; Cramer et al. 2016; Bright et al. 2015; Ravindran et al. 2014) or burnout (Han 2018), characterized by a reduced interest in logging on and using social media,

✉ Jianling Ma
jianling_ma@163.com

Chang Liu
294332805@qq.com

¹ Yangtze Normal University, JuXian Road, FuLing District, Chongqing 408100, China

² Chongqing University of Posts and Telecommunications, Chongwen Road, Nan'an District, Chongqing 400615, China

and even an eagerness to get away from such platforms. Thus far, there is no consensus definition of this phenomenon, and various terms such as “Facebook fatigue” (Cramer et al. 2016), “social networking services fatigue” (Lee et al. 2016), and “social media burnout” (Han 2018) are used by different researchers. Although the terms used vary, the underlying nature of the phenomenon they describe is the same. Social media burnout is defined as the degree to which the user feels exhausted when using social media (Han 2018). It include three dimensions: emotional exhaustion, depersonalization and ambivalence. The emotional exhaustion dimension refers to the degree to which the user regard that their resources such as time and effort were depleted by the usage of social media. Depersonalization refers to the emotional gap between user and the social media which is the result of exhaustion. The ambivalence indicates the ambiguity about the favorable outcome of social media use. If the service that social media organization can not fully meet the users’ requirement, then user would question whether to quit or stay with such platform considering the limited usefulness.

Previous investigations have shed some light on the mechanism underlying how social media burnout develops from a perspective of overload. For example, it has been suggested that users’ decreased enthusiasm for social media activity may be caused by information overload, communication overload, system overload, and social overload (Luqman et al. 2017; Yao and Cao 2017; Lee et al. 2016; Maier et al. 2015). However, it is not clear in the literature where is the overload come from. One source of the overload may stem from social media addiction. According to the core point of information processing theory, individuals have limited cognitive capacity to process information (Miller 1956). If the volume of incoming information increased, the information processing capacity would exhaust quickly. When information supply exceed one’s processing capacity, then individual would experience overload. For users with excessive social media utilization, they may exposed to so many posts, comments, and communication requirements that they may have reduced processing capacity which lead to overload. Supporting this viewpoint, evidence have shown that ubiquitous connectivity with social networking sites based on smartphone is positively correlated with information overload, which in turn lead to social media fatigue (Zhang et al. 2016). Moreover, evidence have show that compulsive use of technology, the core nature of technology addiction such as Social media addiction, is positively correlated with social media burnout (Dhir et al. 2018; Oberst et al. 2017; Wegmann et al. 2017).

Based on the above literature, it is reasonable to assume that social media addiction may link with burnout. However, such tentative idea have yet been tested. Thus, we propose the first hypothesis:

H1: Social media addiction is a significant predictor of social media burnout.

The Mediating Role of Envy

People are constantly comparing themselves to others to obtain a better understanding of themselves, in a process known as social comparison (Festinger 1954). If others are perceived as superior to the individual, such comparison elicits negative feelings, such as envy and jealousy. Moreover, this process of social comparison usually occurs automatically and cannot be avoided. Therefore, it is plausible that this process occurs not only in offline interactions, but also in the context of online communication (van Koningsbruggen et al. 2017). With the emergence and popularity of social media, people now can view others’ posts to learn about their friends’ lives. The ample information disclosed on social media platforms makes them ideal venues for individuals to engage in social comparison. There is already evidence linking social media use and envy. For example, increased Facebook use significantly predicts Facebook-related jealousy (Błachnio et al. 2017). Only passive (as opposed to active) Facebook use affects envy (Griths et al. 2014). Moreover, time spent on social media is positively associated with envy, and heavy Facebook users experience higher levels of Facebook envy than do light users (Tandoc et al. 2015). Based on these findings, it is possible that social media addiction is positively correlated with social media envy.

Concerning the relationship between envy and social media burnout, few studies have been conducted to explore whether these variables are correlated. In a recent study aiming to clarify the relationships between social comparison, social media burnout, and intention to switch, the researchers were interested in whether envy and shame mediate these relationships (Lim and Yang 2015). They found that envy mediates the relationship between social comparison and intention to switch, but not between social comparison and burnout. However, this study used only four items to assess the emotion of envy, and these items were too general to apply specifically to social media settings, such as “I envy him/her” or “I envy him/her very much”. Thus, in the present study, we used a scale specifically designed for social media to measure the emotion of envy (Tandoc et al. 2015). We expected to observe a positive correlation between envy and social media burnout. In other words, envy was hypothesized to mediate the link between excessive use of social media and burnout.

H2: Social media envy mediates the relationship between excessive social media use and social media burnout.

The Mediating Role of Social Media Use Anxiety

Although evidence shows that social media use can bring enormous benefits to individuals, there are also adverse outcomes associated with social media use. Numerous studies have found that social media use is associated with depression (Banjanin et al. 2015; Pantic 2014; Jelenchick et al. 2013; Adams and Kisler 2013), reduced well-being (Seydi Ahmet Satici 2018; Park and Baek 2018; Wang et al. 2017a, b; Stead and Bibby 2017; Krämer et al. 2017; Wen et al. 2016; Tromholt 2016; Meier et al. 2016), and psychological distress (Marino et al. 2018; Bazarova et al. 2017). Moreover, there are studies demonstrating a link between social media and anxiety (Vannucci et al. 2017; Primack et al. 2017; Woods and Scott 2016; Seabrook et al. 2016; Shaw et al. 2015; McCord et al. 2014).

However, these studies assess anxiety in general, rather than specifically anxiety that occurs during use of social media platforms. As in face-to-face circumstances, when people are sharing, posting and interacting through social media, they may also experience a certain degree of anxiety. The above findings associating social media use and general anxiety imply the possibility that social media use itself may be a situation that can induce anxiety. To investigate this issue, researchers have developed a social media use anxiety scale that is specifically designed for a social media setting (Alkis et al. 2017), and have further demonstrated that social media use is indeed a situation that can evoke feelings of anxiety. Based on the abovementioned findings, in the present study, we expected to find a positive relationship between excessive use of social media and social media use anxiety.

Anxiety usually stems from people's fears of interacting with others or of being negatively evaluated during social interaction. Numerous lines of evidence show that people may deliberately avoid social anxiety-inducing situations so that they are not subjected to others' potentially negative judgments of them. Traditionally, social anxiety has been investigated and measured in face-to-face communication and offline settings. With the emergence of social media, it is also possible that if people experience more anxiety, this produces an intention to get away from social media platforms, leading to a reduction in their use of social media or avoidance of them altogether. Just as researchers have pointed out (Alkis et al. 2017), studies aiming to explore the relationship between social anxiety and social avoidance behaviors on social media platforms are needed. Thus, we predicted that social anxiety could influence social media burnout. That is, we hypothesized that social media use anxiety mediates the relationship between excessive use of social media and burnout.

H3: Social media anxiety also mediates the relationship between excessive social media use and social media burnout.

The Serial Mediating Role of Envy and Social Media Use Anxiety

Although envy and social media use anxiety may perhaps mediate the relationship between excessive use of social media and burnout in parallel, there is also a possibility that the two act in series as mediators. In spite of the lack of evidence that social media envy could influence anxiety, envy has been repeatedly found to have an effect on psychological distress, such as depression (Chae 2018; Tandoc et al. 2015), in the context of social media. In sum, we further hypothesized that envy and social media use anxiety serially mediate the relationship between excessive use of social media and burnout.

H4: Social media envy and anxiety together serially mediate the relationship between excessive social media use and social media burnout.

To sum up, the present study aimed to explore effect of social media addiction on burnout, and tested whether social media envy and anxiety mediate the above association.

Methods

Participants

The participants were 530 university students attending Chongqing University of Posts and Telecommunications seated in western China. Eleven participants' data were deleted due to too much missing data. The remaining 519 students were including 216 men (19.42 ± 1.49) and 303 women (18.81 ± 1.10). All participants had experience of using social media, such as QQ, Wechat, and Sina Weibo.

Measures

Social Media Addiction Scale This scale was developed by our research group based on the most popular social media platforms in China: QQ and space, Wechat, and Sina Weibo (Liu and Ma 2018). Items were each judged on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Example items such as "If I cannot use social media, I feel anxious". The higher the total score, the higher the level of addiction to social networking sites. In the present study, Cronbach's alpha coefficient was 0.94.

Social Media Envy Scale The social media envy scale was adapted from the Facebook Envy scale (Tandoc et al. 2015) by replacing “Facebook” with “social media”. The scale included 8 items measuring the respondent’s level of envy when using social media; participant rated each on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The higher the total score, the higher the level of envy experienced during use of social media platforms. In the present study, Cronbach’s alpha was 0.76.

Social Anxiety Scale for Social Media Use This scale was developed to measure anxiety levels during use of social media, and consisted of 21 items divided into 4 subscales: shared content anxiety, privacy concern-related anxiety, interaction anxiety, and self-evaluation anxiety (Alkis et al. 2017). Items were judged on a 5-point Likert scale from 1 (*never*) to 5 (*always*). The higher the total score, the higher the level of social media use anxiety. In the present study, the Cronbach’s alpha was 0.95.

Social Media Burnout Scale This scale was developed to measure level of burnout which make up of 11 items divided into 3 subscales: ambivalence, emotional exhaustion, and depersonalization (Han 2018). Items were judged on a 7-point Likert scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Example items such as “I don’t know why I’m using social media”. In the present study, Cronbach’s alpha for the whole scale was 0.90, and 0.80, 0.79 and 0.90 for emotional exhaustion, depersonalization and ambivalence.

Procedure

Participants were recruited from the university by two female research assistants. They voluntarily agreed to participate in the study, and received no monetary compensation or course credit. Informed consent was obtained from all individual participants included in the study. Paper versions of the measures were administered to all the participants after they had provided basic demographic data in the classroom. After the questionnaires were completed, research assistants checked them to ensure that there were no missing data.

Data Analysis

Data analysis were performed in three steps. First, a factor analysis was used to conduct a common variance analysis for testing common method bias. Second, scores from four measures were performed descriptive and correlational analyses in SPSS 20.0. Third, to test the mediation model, Bayesian structural equation modeling (SEM) was conducted in AMOS 20.0.

The Bayesian SEM approach outperforms maximum likelihood (ML) estimation in three aspects (Yuan and Mackinnon 2009). First, prior information is incorporated into the

mediation analysis, which improves the efficacy of estimates. Second, inference is straightforward and precise. Third, this approach is simpler for multilevel mediation analyses. The Bayesian approach uses an iterative Markov Chain Monte Carlo (MCMC) method to take repeated samples from the dataset to estimate all the parameters for each model, and generates a large number of estimates for each model parameter. In this way, the dataset (along with prior knowledge) is used to generate a posterior likelihood distribution for each parameter estimate. The statistical significance of each parameter is evaluated using the Bayesian credible interval. When the 95% Bayesian credible interval does not overlap with zero, the parameter is regarded as statistically significant.

Bayesian SEM uses model assessment measures that differ from ML estimation. In the present study, model fit was assessed by posterior predictive p value and the value of a convergence statistic (CS). The posterior predictive p value was used to represent the model’s goodness-of-fit; however, there is no clear-cut threshold p value that is generally agreed to indicate an acceptable model fit. Therefore, the p should be interpreted like an SEM fit index: a value closer to 0.5 indicates a better model fit, whereas a value closer to 0 or 1 suggests a poor fit (Song and Lee 2006). A CS value of less than 1.002 suggests that the model has converged. A CS value equal to 1.0000 means that the model is a perfect fit. We additionally used the deviance information criterion (DIC). The DIC is a Bayesian generalization of the Akaike information criterion, and Models with smaller DIC values should be preferred.

Regarding the estimation of indirect effects, the Bayesian SEM approach not only calculates the mean value of and provides a credible interval over the size of the indirect effect for a specific path and compares this to the value of the indirect effect arising from an alternative path, but also gives a p value indicating whether the indirect effect is larger or smaller than zero in one third of, two thirds of, and all of the MCMC samples. Thus, this approach outperforms other methods. Our models employed 500 burn-in samples and 10,000 post-burn-in samples, which were thinned twice. We report the unstandardized estimates for the paths and their 95% Bayesian credible intervals (CI). As we used weakly informative priors, the mean coefficient of each variable was set to a uniform distribution with the default value. A CS value less than 1.002 indicates model convergence. Bayesian SEM model fit was assessed by the posterior predictive p value, where values close to 0.5 indicate the best model fit.

Results

Common Method Biases

Common variance analysis was applied to the four questionnaires through factor analysis. The Chi-square statistic of

Bartlett’s test of Sphericity was significant. After principal component analysis, 11 eigenvalues greater than 1 were extracted. The first factor to explain the variance was 20.3%, which was less than the 40% required by the critical standard (Podsakoff et al. 2003), demonstrating that the questionnaires used in the current study had no significant issue with common method biases.

Descriptive Statistics and Correlation Analysis

Prior to Bayesian SEM analysis, descriptive analyses were conducted and correlations among variables examined (Table 1). As seen in Table 1, all variables were significantly inter-correlated. To explore the distribution of the social media addiction in our sample, the total social media addiction scores were transformed into Z score. we found that 77 students’ Z score were above 1, indicating that 14.8% of our sample were classified into addiction group.

The Mediation Analysis

Bayesian SEM were used to test the mediation effect. It is show that model converged with a CS equal to 1.0000. The goodness-of-fit measures showed that model was supported by the data, posterior predictive $p = 0.49$, DIC = 28.21, number of effective parameters = 14.01. The specific parameter estimates for model are presented in Table 2, where it can be seen that all the parameters were significant and all the mediation effect estimates were statistically significant because all the 95% CI don’t cover zero. Moreover, the mediation effect was stable across MCMC samples (Table 3).

To be specific, social media addiction, envy and social media use anxiety are all significant predictor of social media burnout ($p < 0.01$). H1 was supported. As far as the mediation effect of envy concerned, it is found that social media addiction is a significant predictor of envy. Thus envy worked as a mediator between social media addiction and burnout, and mediation effect is 0.0333(95% CI, [0.0048, 0.0631]). H2 was supported. In terms of the mediatory role of social media use anxiety, it is found that social media addiction is a significant predictor of social media anxiety. Thus it worked as a mediator between social media addiction and burnout, and mediation effect is 0.0795(95% CI, [0.0546, 0.1075]). H3

were supported. Interestingly, envy and social media use anxiety worked as serial mediator between social media addiction and burnout, because social media use anxiety is significantly predicted by envy. The serial mediation effect is 0.0422 (95% CI, [0.0282, 0.0588]). H4 were supported. In addition, the three path of mediation effect are all relatively stable in the present sample due to the analysis results that the mediation effect were all larger that zero at a possibility level of 0.05.

Gender Differences for Mediation Effect

To examine the gender differences, the group analysis were performed to test if the model is proper both for males and females. The resultant data showed that the model is suitable for both males and females, $p = 0.49$, DIC = 56.26, number of effective parameters = 27.78, indicating the model were cross-gender confirmed.

Discussion

We aimed to explore whether social media addiction contributes to social media burnout, and whether envy and social media use anxiety mediate this association. Our results confirmed our hypotheses. To be specific, social media addiction contribute significantly to social media burnout, that is the higher the level of social media addiction, the heavier the burnout symptoms. Moreover, envy and social media use anxiety mediate such association in both parallel and serial way. The implications and significance of the present study were discussed below.

The Association between Social Media Addiction and Burnout

To our knowledge, the present study is among the first to explore the issue of social media burnout from the perspective of excessive use of social media. Although prior studies imply such association (Zhang et al. 2016), the present study confirmed this link. Such a link is reasonable, considering that more time spent on social media platforms increases the possibility that individuals may expose themselves to amounts of information that lead to information overload, as evidenced by

Table 1 Descriptive statistics and results of correlational analysis of variables ($N = 519$)

	M	SD	Min	Max	Skewness	Kurtosis	Reliability	1	2	3	4
1. Social media addiction	71.04	19.35	28	129	0.061	-0.290	0.94	1			
2. Envy	14.21	3.80	8	28	0.261	0.200	0.76	0.527**	1		
3. Anxiety	45.26	15.40	21	105	0.345	0.017	0.95	0.556**	0.557**	1	
4. Burnout	36.29	11.75	11	77	-0.191	0.193	0.90	0.474**	0.420**	0.540**	1

** $p < 0.01$ (2-tailed)

Table 2 Results of the Bayesian SEM analysis

	Mean	SE	SD	CS	CI	
					95% Lower bound	95% Upper bound
Regression weights						
Anxiety <-- Addiction	0.2888*	0.0002	0.0320	1.0000	0.2255	0.3515
Burnout <-- Envy	0.3217*	0.0008	0.1404	1.0000	0.0465	0.5986
Envy <-- Addiction	0.1034*	0.0000	0.0074	1.0000	0.0888	0.1179
Burnout <-- Anxiety	0.2752*	0.0002	0.0355	1.0000	0.2060	0.3451
Burnout <-- Addiction	0.1327*	0.0001	0.0277	1.0000	0.0784	0.1869
Anxiety <-- Envy	1.4824*	0.0009	0.1628	1.0000	1.1607	1.8015
Indirect effect paths						
Burnout <-- Envy <-- Addiction	0.0333*	0.0001	0.0148	1.0000	0.0048	0.0631
Burnout <-- Anxiety <-- Addiction	0.0795*	0.0001	0.0135	1.0000	0.0546	0.1075
Burnout <-- Anxiety <-- Envy <-- Addiction	0.0422*	0.0000	0.0078	1.0000	0.0282	0.0588

*= statistically significant (i.e., the 95% credible interval does not include zero); CS = Convergence Statistic

the fact that overload is positively correlated with social media fatigue.

The Mediating Role of Envy

Social media addiction not only directly give rise to burnout, but also exerted indirect effects through two different paths. The first path is through the mediating role of envy. To be specific, the higher the level of social media addiction, the higher the level of envy, which in turn lead to severe level of burnout. The link between addiction and envy is consistent with previous findings that time spent on social media is positively associated with envy, and that heavy Facebook users experience higher levels of Facebook envy than do light users (Tandoc et al. 2015; Wallace et al. 2017). In terms of the relationship between envy and burnout, we found a positive correlation between the two variables, which is inconsistent with a previous study (Lim and Yang 2015). People who use social media excessively may have more chances to experience stronger feelings of envy, which in turn give rise to feelings of burnout. In other words, envy mediates the relationship between addiction and burnout.

The Mediating Role of Social Media Use Anxiety

In present study, social media use anxiety mediated the relationship between social media addiction and burnout. To be specific, the higher level of social media addiction, the higher level of anxiety the individual may experience, and finally they may feel elevated level of burnout. The results are consistent with prior studies. For example, previous research has shown that use of Facebook may lead to anxiety (Vannucci et al. 2017; Primack et al. 2017; Hussain et al. 2017; Hu et al. 2017; Han et al. 2017). However, no previous study has examined the effect of social media addiction on social media anxiety, and little is known about the mediating role of social media anxiety in the relationship between social media addiction and burnout. Extending earlier studies, the present study found that social media setting as a social communications could also elicit anxiety as real-world settings. Moreover, such anxiety in social media settings could lead to negative outcomes such as burnout, which is consistent with the findings that anxiety in face to face communications could predicts avoidant behavior in real social situations (Lange 2010).

Finally, our results suggested that envy and social media use anxiety mediated the relationship between social media

Table 3 The probability that each indirect effect exceeds zero in each subset of MCMC samples

Indirect Effect Path	Indirect effect value	P	P1	P2	P3
Burnout <-- Envy <-- Addiction	0.0333	0.9892	0.9884	0.9892	0.9899
Burnout <-- Anxiety <-- Addiction	0.0795	1.0000	1.0000	1.0000	1.0000
Burnout <-- Anxiety <-- Envy <-- Addiction	0.0422	1.0000	1.0000	1.0000	1.0000

P represents the probability across all samples; P1, P2 and P3 represent the probability in respective thirds of the samples

addiction and burnout in a sequential fashion, supporting our H4. Specifically, the effect of social media addiction on social media burnout was sequentially mediated by envy and social media use anxiety, which indicates that individuals who excessively use social media experience higher levels of envy, which in turn can induce more intense feelings of anxiety, thereby increasing the risk of burnout symptoms. Moreover, it is noted that this sequential indirect effect was relatively stable across all samples.

Significance and Limitations

Few studies have tested the relationship between social media addiction and burnout, not to mention the mediating roles of envy and social media use anxiety. Using a design based on strong theoretical and empirical grounds, the present study contributes to the literature by simultaneously examining the effects of envy and social media use anxiety. The proposed multilevel mediation model here can further offer a more comprehensive account of how social media burnout develops.

Our findings also have significant implications for potential interventions to tackle the phenomenon of social media burnout. First, in terms of social media use, we suggest that individuals curb and reduce social media use. Existing evidence show that quitting and even reduce Facebook use increase users' well-being (Tromholt 2016), and the effect are more significant for heavy users. Second, feelings of envy generated by use of social media platforms should be minimized in order to maintain users' eagerness to participate. One way to reduce envy is to encourage people to use social media in an active rather than a passive manner, based on evidence from cross-sectional, experimental, and longitudinal studies that passive use of social media undermines users' well-being through social comparison which in turn lead to envy (Verduyn et al. 2015). Third, alleviating the feeling of social media use anxiety would also be effective in reducing feelings of burnout.

The following limitations of the present study should be noted. First, considering its cross-sectional design, inferences about causal relationships in the path model cannot be drawn. Future studies using longitudinal data could be conducted to further confirm the direction of causality in the paths proposed in the present study. Second, only university students were recruited for this study, so it is not clear whether the present results can be generalized to other demographics. Future samples should include participants of diverse ages and backgrounds. In addition, as a result of use of the convenience sampling method, balanced numbers of each sex were not achieved (there were more female participants). Third, the self-reported nature of the measures used in the present study leaves open the possibility that the reported information may not accurately reflect the underlying values of each variable. Finally, the mechanism revealed in the present study is based on participants' use of popular Chinese social media

platforms. As social media applications vary extensively, other social media contexts should be investigated.

Conclusions

The social media addiction contribute to social media burnout. Moreover, envy and social media use anxiety mediate such association in both a parallel and serial way.

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Compliance with Ethical Standards

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Conflict of Interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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