

Relationship Between Daily Stress, Depression Symptoms, and Facebook Addiction Disorder in Germany and in the United States

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Abstract

This study investigated the link between experience of daily stress, depression symptoms, and the Facebook Addiction Disorder (FAD) in Germany and in the United States. In samples from both countries (German sample: $N=531$; U.S. sample: $N=909$), daily stress was positively associated with FAD. Depression symptoms significantly positively moderated this positive relationship. Thus, current findings demonstrate that depressed individuals who often tend to intensively use Facebook to escape from daily stress and to find relief and social support are at enhanced risk to develop FAD, which reinforces their negative symptoms. Therefore, interventions for depressed individuals should include alternative strategies to cope with daily stressors.

Keywords: daily stress, depression symptoms, Facebook Addiction Disorder, Germany, United States

Introduction

STRESSFUL EVENTS ACROSS different aspects of daily life (e.g., family, study, and work) pose a high psychological burden on an individual, which may negatively impact subjective well-being.¹ Although some people rise to the challenges of such stressors, others try to escape from them. In the 21st century, many individuals who experience daily stress resort to use of social online platforms.^{2,3}

With over 23.7 billion members, Facebook is currently the most popular social platform.⁴ Previous studies described intensive active Facebook use (e.g., writing status updates and uploading photos) to contribute to distraction from everyday problems and to mood improvement.^{5,6} However, it also fosters the risk of developing a strong obsessive need to stay permanently online, which may cause interpersonal conflicts with the offline world and is positively linked to anxiety symptoms and insomnia.^{7,8} This need has been called Facebook Addiction Disorder (FAD)⁹ and is defined by six typical characteristics¹⁰: salience (i.e., permanent thinking about Facebook), tolerance (i.e., heightened amounts of Facebook use are required to attain positive effect), mood modification (i.e., mood improvement by Facebook use), relapse (i.e., reverting to extensive Facebook use after unsuccessful attempts of its reduction), withdrawal symptoms (i.e., feeling nervous without Facebook use), and conflict (i.e., interpersonal problems caused by intensive Facebook use).

Earlier research indicated that individuals who experience high level of daily stress use Facebook to escape from their offline problems, to find relief, and to receive social support.¹¹ The more positive experiences they have on the social platform, the higher is the probability that they will engage in further Facebook use. This, however, may enhance their risk of developing of FAD.³ Accordingly, daily stress was found to positively predict the level of FAD across a time span of one year.¹² However, not all individuals experiencing daily stress are equally vulnerable to FAD. Therefore, the question arises which factor may moderate this link.

Ryan et al.¹¹ described that depressed persons, who frequently feel overwhelmed by the requirements of everyday life, often turn to excessive Facebook use to at least temporarily escape from their offline problems. Furthermore, depression symptoms were demonstrated to positively predict the level of FAD.^{7,8,13,14} On Facebook, individuals with enhanced depression symptoms have many possibilities for social interactions. Their interaction partners provide them with positive social feedback that they often miss offline (e.g., “Likes” and positive comments). Such positive experiences may contribute to the probability that particularly depressed individuals tend to frequently escape into the Facebook world for further positive feedback. This, however, may enhance their risk of developing FAD.^{11,15} Thus, considering previous research, it may be assumed that depression symptoms moderate the association between daily stress and FAD.

On this background, this study aimed to examine whether depression symptoms may serve as a moderator between daily stress and FAD (i.e., the higher the depression symptoms, the closer the link between daily stress and FAD).

Most previous studies on FAD were conducted with young students,^{9,16} which limit the generalization of their findings, as it remains unclear whether the same result pattern would appear in other populations. To increase the heterogeneity of the considered populations, we included samples from two countries, where Facebook use belongs to the daily life of a large part of the population⁴: (a) A young student sample from Germany and (b) an older sample of mostly employed individuals from the United States. Earlier research from both countries has described an increase of problematic Facebook use.^{8,17,18} We expected to find the same result pattern in both samples.

Materials and Methods

Procedure and participants

German sample. The sample comprised 531 Facebook users [74.8 percent women; age (years): $M(SD)=21.63(4.45)$, range: 18–56; all students] recruited from October to December 2018 by an e-mailed invitation that was sent to a randomly selected group of 600 students of a large university in the Ruhr region. At the beginning of their studies, the students had agreed to be invited to online and offline surveys on different topics. The e-mail invitation included a link leading to an online survey in the German language. Participation was compensated by course credits.

U.S. sample. Data of 909 Facebook users [47.9 percent women; age (years): $M(SD)=37.24(10.71)$, range: 20–74; occupation: 89 percent employed, 7.6 percent unemployed, 2.4 percent retired, and one percent studying] were collected in February 2019 by an online survey in the English language using the crowdsourcing Internet marketplace Amazon Mechanical Turk (MTurk). Participants received a compensation amounting to 2.70 USD.

This study was approved by the responsible ethics committee. The requirement for participation, which was voluntary, was a current Facebook membership. All participants were properly instructed and gave online their informed consent to participate. *A priori* conducted power analyses (G*Power program, version 3.1) revealed that the sample sizes were sufficient for valid results (power >0.80 , $\alpha = 0.05$, effect size $f^2 = 0.15$).¹⁹

Measures

Daily stress. To measure daily stressful experiences, that is, inconveniences or difficulties in daily life (e.g., related to family, health, finances, or study), for the past 12 months, the Brief General Daily Stressors' Strain Screening (BGD3S; English and German version: Scholten et al., unpublished manuscript) was used. The BGD3S includes nine items rated on a 5-point Likert scale (0 = *not at all*, 4 = *very much*; current scale reliability: German sample: Cronbach's $\alpha = 0.792$; U.S. sample: $\alpha = 0.897$).

Depression symptoms. The depression subscale of the Depression Anxiety Stress Scales 21 (DASS-21; English

version: Lovibond and Lovibond²⁰; German version: Nilges and Essau²¹) assesses depression symptoms for the previous week with seven items rated on a 4-point Likert scale (i.e., "I couldn't seem to experience any positive feeling at all"; 0 = *did not apply to me at all*; 3 = *applied to me very much or most of the time*; current reliability: German sample: $\alpha = 0.901$, U.S. sample: $\alpha = 0.946$).

Facebook Addiction Disorder. The brief version of the Bergen Facebook Addiction Scale (BFAS; English version: Andreassen et al.¹⁰; German version: Brailovskaia and Margraf⁹) was included to assess FAD for the past year. This instrument consists of six items (e.g., "Felt an urge to use Facebook more and more?") according to the six core features of FAD rated on a 5-point Likert scale (1 = *very rarely*, 5 = *very often*; current reliability: German sample: $\alpha = 0.913$, U.S. sample: $\alpha = 0.924$).

Statistical analyses

Statistical analyses were conducted using SPSS 24. In both groups, relationships between the investigated variables were assessed by zero-order correlation analyses. Furthermore, a hierarchical regression analysis (95% CI) was calculated to assess the potential moderation effect of depression symptoms on the association between daily stress and FAD in both samples. Thereby, FAD was considered as dependent variable. Age and gender were included in Step 1 as control variables. After mean-centering, daily stress and depression symptoms were added in Step 2, and their interaction was added in Step 3. A significant interaction term suggests a moderating effect of depression symptoms. In both regression analyses, there was no violation of multicollinearity assumption as all values of tolerance were >0.25 , and all variance inflation factor values were <5 .²²

Results

Table 1 presents the descriptive statistics and results of the correlation analyses of both samples. In both samples, FAD, daily stress, and depression symptoms were significantly positively interrelated (all: $p < 0.01$).

Furthermore, Table 1 shows results of the hierarchical regression analysis of both samples. In both samples, the interaction term of daily stress and depression symptoms added predictive variance to the regression model ($p < 0.01$) indicating a significant moderation effect.

As shown in Figure 1, the positive link between daily stress and FAD emerged in people with low ($M - 1SD$), medium (M), and high ($M + 1SD$) depression symptoms. However, this association was remarkably higher for individuals with high level of depression symptoms.

Discussion

Previous research has described a positive association between the experience of daily stress and addictive Facebook use.¹² In this study, depression symptoms were found to positively moderate this link. Thus, present results complement earlier studies demonstrating that particularly depressed individuals are vulnerable to FAD.

Persons with an increased level of depression symptoms, who feel overwhelmed by requirements of everyday life more

TABLE 1. DESCRIPTIVE STATISTICS, CORRELATION ANALYSES OF INVESTIGATED VARIABLES, AND HIERARCHICAL REGRESSION ANALYSES PREDICTING FACEBOOK ADDICTION DISORDER

		<i>German sample, N=531</i>			<i>U.S. sample, N=909</i>		
<i>Descriptive statistics and correlation analyses</i>							
	M (SD)	Min-max	(2)	(3)	M (SD)	Min-max	(3)
(1) FAD	8.75 (4.69)	6-29	0.496**	0.426**	14.13 (6.49)	6-30	0.605**
(2) Daily stress	13.52 (7.22)	0-34		0.661**	12.77 (8.71)	0-33	0.549**
(3) Depression	6.65 (5.47)	0-21			5.97 (6.22)	0-21	0.761**

<i>Regression analyses</i>												
	B	β	95% CI	T	Adjusted R ²	Changes in R ²	B	β	95% CI	T	Adjusted R ²	Changes in R ²
<i>Step 1, F(2, 528) = 18.935, p < 0.001</i>					0.063	0.067					0.094	0.096
Age	-0.070	-0.066	-0.157 to 0.017	-1.576			<i>Step 1, F(2, 906) = 47.981, p < 0.001</i>					
Gender	2.723**	0.253**	1.832 to 3.614	6.004			-0.189**	-0.312**	-0.227 to -0.151	-9.768		
<i>Step 2, F(4, 526) = 55.814, p < 0.001</i>					0.293	0.231					0.416	0.322
Daily stress	0.248**	0.382**	0.186 to 0.311	7.841			<i>Step 2, F(4, 904) = 162.478, p < 0.001</i>					
Depression	0.119**	0.139**	0.036 to 0.202	2.824			0.316**	0.423**	0.258 to 0.373	10.802		
<i>Step 3, F(5, 525) = 65.991, p < 0.001</i>					0.380	0.088					0.438	0.023
Daily stress × depression	0.033**	0.343**	0.026 to 0.041	8.672			0.198**	0.190**	0.118 to 0.279	4.840		
							<i>Step 3, F(5, 903) = 142.775, p < 0.001</i>					
							0.021**	0.172**	0.014 to 0.027	6.134		

Notes: In each step, only new included variables are presented.

** $p < 0.01$. β , standardized coefficient beta; B, nonstandardized coefficient beta; CI, confidence interval; FAD, Facebook Addiction Disorder; M, mean; max, maximum; min, minimum; SD, standard deviation.

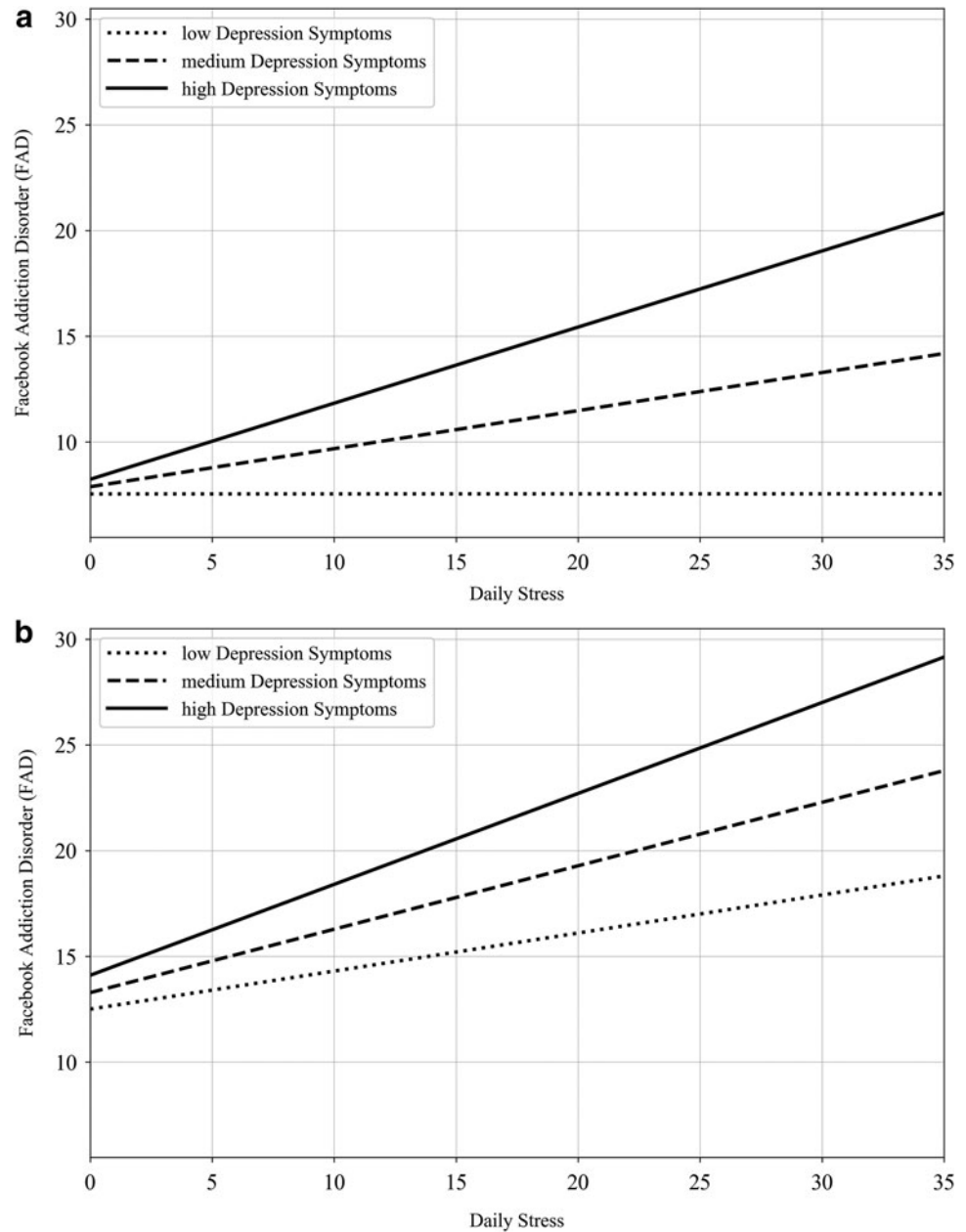


FIG. 1. Results of the regression model with daily stress predicting FAD for low ($M - 1SD$), medium (M), and high ($1 + 1SD$) levels of the moderator depression symptoms: **(a)** German sample, **(b)** U.S. sample. FAD, Facebook Addiction Disorder. M , mean, SD , standard deviation.

than others, often consider Facebook use as the only available coping strategy.¹¹ In particular, they are attracted by the possibility to immerse in an exciting online world created by Facebook that allows them to temporarily forget negative offline experiences and to receive positive social feedback.²³ Although in the short term this coping strategy may foster positive mood, in the long term it enhances the risk of developing FAD, which negatively impacts subjective well-being.¹² Thus, the current results emphasize the necessity to make excessive Facebook use a subject of discussion in interventions for depressed persons. Such individuals could particularly profit from alternative coping strategies, such as physical activity (e.g., jogging or cycling), which have been previously demonstrated to buffer the negative impact of daily stress and, therefore, to protect well-being.²⁴

In this study, the same result pattern was found in two different population groups—young students in Germany

and older employees in the United States. This finding underscores the importance of depression symptoms as moderator between daily stress and FAD. However, the relationship between depression symptoms and FAD might be more complex than could be shown in this study. Social conflicts belong to the typical characteristics of FAD.¹⁰ Individuals who engage in intensive Facebook use often neglect their offline obligations at home and at work, which contributes to interpersonal problems. It may be assumed that these negative experiences can enhance depression symptoms. Therefore, it is conceivable that depression symptoms, on the one hand, contribute as a moderator to the development of FAD, and, on the other hand, FAD fosters the enhancement of depression symptoms. This study confirmed the first part of this assumption. Future research is needed to investigate the second part of this assumption.

Notably, this study has some limitations. Given the cross-sectional nature of the current data, only hypothetical conclusions on causality of the demonstrated associations may be drawn. Future longitudinal studies are necessary for real causal conclusions. Furthermore, even though the size of both investigated samples was sufficient for valid results, they were not equal. In addition, the student sample comprised mostly young female participants from the same geographical area in Germany, which limits the generalizability of current findings. Therefore, future research should investigate whether the present findings can be replicated in students from other geographical areas. Furthermore, the instructions of the instruments used in this study include different time windows. Following the original versions, daily stress (Scholten et al. unpublished manuscript) and FAD¹⁰ are measured for the past 12 months. In contrast, depression symptoms²⁰ are assessed for the previous week. Future studies should investigate whether the current findings remain robust when the same time window is used for all included instruments.

To conclude, this study found a close positive association between daily stress, depression symptoms, and FAD. Moreover, the present findings underscore the importance of depression symptoms as moderator between daily stress and FAD. Future research is advised to investigate further moderators of this relationship to understand the mechanisms that may contribute to the development of addictive Facebook use.

Author Disclosure Statement

No competing financial interests exist.

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