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DEVELOPMENT OF A FACEBOOK ADDICTION SCALE^{1, 2}

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Summary.—The Bergen Facebook Addiction Scale (BFAS), initially a pool of 18 items, three reflecting each of the six core elements of addiction (salience, mood modification, tolerance, withdrawal, conflict, and relapse), was constructed and administered to 423 students together with several other standardized self-report scales (Addictive Tendencies Scale, Online Sociability Scale, Facebook Attitude Scale, NEO-FFI, BIS/BAS scales, and Sleep questions). That item within each of the six addiction elements with the highest corrected item-total correlation was retained in the final scale. The factor structure of the scale was good (RMSEA = .046, CFI = .99) and coefficient alpha was .83. The 3-week test-retest reliability coefficient was .82. The scores converged with scores for other scales of Facebook activity. Also, they were positively related to Neuroticism and Extraversion, and negatively related to Conscientiousness. High scores on the new scale were associated with delayed bedtimes and rising times.

Although pathological gambling is the only behavioral addiction, so far, to be assigned status as a formal psychiatric disorder, increasing research has been conducted on other potential behavioral addictions, such as video-game addiction (Fisher, 1994), exercise addiction (Adams & Kirkby, 2002), mobile-phone addiction (Choliz, 2010), online sex addiction (Griffiths, 2012), shopping addiction (Clark & Calleja, 2008), workaholism (Andreassen, Hetland, & Pallesen, 2010), and Internet addiction (Young, 1996; Beard, 2005). With regard to Internet addiction, it has been questioned whether people become addicted to the platform or to the content of the Internet (Griffiths, 1999). Young (2009) argued that Internet addicts become addicted to different aspects of online use. She differentiates between three subtypes of Internet addicts: excessive gaming, online sexual pre-occupation, and e-mailing/texting (Young, 2009). Social networks are one type of online activity in which e-mailing/texting has been predominant. Among social networks, Facebook is by far the most popular, with

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over 600 million users worldwide (Carlson, 2011). In one study, students classified as Internet-addicted used the Internet more for social functions than students considered non-addicted (Kesici & Sahin, 2009).

A recently published review article on social networking and addiction suggests that social network sites are predominantly used for maintenance of established offline networks which, for many, are important in terms of academic and professional opportunities. The maintenance of such networks and staying connected are assumed to function as an attraction factor, which might explain why some individuals use social network sites excessively (Kuss & Griffiths, 2011). Researchers have linked Facebook use to specific individual characteristics. People scoring high on narcissism tend to be more active on social network sites, as social network sites provide an opportunity to present oneself in a favorable way in line with one's ideal self (Buffardi & Campbell, 2008; Mehdizadeh, 2010). Other studies have focused on the five-factor model of personality, in which personality assessment is based on five main dimensions of Extraversion (e.g., being outgoing, talkative), Agreeableness (e.g., being sympathetic and warm), Conscientiousness (e.g., being organized and prompt), Neuroticism (e.g., being nervous and moody), and Openness to experience (e.g., being creative and intellectually oriented) (Wiggins, 1996). Some previous researchers have reported extraversion as positively related to Internet use in general (Yang & Lester, 2003). In addition to social media, addictive tendencies have been reported to be positively related to Extraversion and negatively related to Conscientiousness (Wilson, Fornasier, & White, 2010). Also, Correa, Hinsley, and de Zuniga (2010) reported that Extraversion, Neuroticism, and Openness to experience were all positively associated with frequency of social media use. It has been suggested that extroverts use social media for social enhancement, whereas introverts use it for social compensation, each of which appears to be associated with elevated use (Kuss & Griffiths, 2011). People who score low on Conscientiousness are assumed to use social media as a way of procrastinating, hence, Conscientiousness is assumed to be negatively associated with social media use (Wilson, *et al.*, 2010). Neuroticism is assumed to be positively related to use of social media as it may be a way of seeking support. In addition, social media gives people with high scores on Neuroticism more time for contemplation before acting compared to face-to-face interactions (Ehrenberg, Juckes, White, & Walsh, 2008; Ross, Orr, Sisic, Arseneault, Simmering, & Orr, 2009; Correa, *et al.*, 2010).

Addictive behaviors may also be related to individual differences in sensitivity to reward and punishment. According to Gray (1982), one system, the behavioral inhibition system (BIS), is associated with sensitivity to conditioned punishment, whereas another system, the behavioral

approach system (BAS), is associated with sensitivity to conditioned reward. These two systems can be measured using self-report scales, one scale for BIS, and three subscales for BAS: Reward Responsiveness, Drive, and Fun-seeking (Carver & White, 1994). It has been suggested that high behavioral approach system (BAS) sensitivity predisposes to conditions that are characterized by high engagement in approach behaviors, such as alcohol and drug abuse (Franken, Muris, & Georgieva, 2006). In one study, Internet addiction was positively related to scores on the BIS scale and the BAS Fun-seeking subscale (Yen, Ko, Yen, Chen, & Chen, 2009).

Poor and short sleep has, in several studies, been linked to impaired academic performance (Dewald, Meijer, Oort, Kerkhof, & Bögels, 2010). Recently, studies have shown that excessive use of electronic media may delay bedtimes and rising times (Suganuma, Kikuchi, Yanagi, Yamamura, Morishima, Adachi, *et al.*, 2007; Brunborg, Mentzoni, Molde, Myrseth, Skouverøe, Bjorvatn, *et al.*, 2011). These researchers, however, did not consider the content of computer and mobile-phone use. Since Facebook has become one of the most used sites on the Internet, and since poor sleep may be detrimental to the academic performance of students, investigation of whether Facebook addiction, in particular, may be directly associated with sleep habits would be of interest.

In relation to assessing Facebook addiction, Wilson, *et al.* (2010) previously developed the Addictive Tendencies Scale, which has three items reflecting salience, loss of control, and withdrawal. Although these three aspects have been central in thinking about addictions, in the literature, addiction has involved six core components: (1) salience—the activity dominates thinking and behavior; (2) mood modification—the activity modifies/improves mood; (3) tolerance—increasing amounts of the activity are required to achieve previous effects; (4) withdrawal—the occurrence of unpleasant feelings when the activity is discontinued or suddenly reduced; (5) conflict—the activity causes conflicts in relationships, in work/education, and other activities; and (6) relapse—a tendency to revert to earlier patterns of the activity after abstinence or control (Brown, 1993; Griffiths, 1996, 2005). In line with this, studies have shown that social-network site use can lead to a variety of negative consequences such as decrease in real-life communities, worsening of academic performance, and relationship problems (Kuss & Griffiths, 2011).

As addiction to Facebook may be a specific form of Internet addiction, and since the use of Facebook is increasing very rapidly, there is a need for a psychometrically sound procedure for assessing a possible addiction. Against this background, a Facebook addiction scale (the Bergen Facebook Addiction Scale) with as few items as possible (one reflecting each of the six above-mentioned elements of addiction, ensuring its content va-

lidity) was constructed. A new Facebook addiction scale should correlate highly with measures of similar constructs (convergent validity) and less with measures of more divergent or unrelated constructs (discriminant validity) (Cozby, 2009).

The following hypotheses were tested: (1) the Bergen Facebook Addiction Scale (BFAS) will have a unidimensional factor structure with high factor loadings for all items, fit indexes [root mean square error of approximation (RMSEA) and comparative fit index (CFI)] showing good fit with the data and factor loading invariance across sexes; (2) the 3-week test-retest reliability will be high ($r > .75$); (3) ratings on the BFAS will correlate positively and significantly with scores on other scales of Facebook use (the Addictive Tendencies Scale, as well as scales measuring Facebook attitudes and use, respectively); (4) ratings on the scale will be positively related to those on Neuroticism and Extraversion and negatively related to those on Conscientiousness; (5) ratings on the scale will be positively associated with ratings on the BIS scale and with those on the BAS Fun-seeking subscale; and (6) the scores on the BFAS will correlate positively and significantly with bedtimes and rising times.

METHOD

Participants

The sample comprised a total of 423 college students (227 women). Their mean age was 22.0 yr. ($SD = 4.0$). A subsample ($n = 153$, 118 women, 35 men) of these were present at a later lecture and were used for test-retest of the BFAS. The mean age of the retest sample was 21.3 yr. ($SD = 4.1$).

Procedure

Potential items to be included in the Facebook addiction scale were constructed for the six basic components of addiction proposed by Brown (1993) and Griffiths (1996). Three items for each component were chosen. Wording was similar to that used in the diagnostic criteria for pathological gambling (American Psychiatric Association, 2000) and in the Game Addiction Scale (Lemmens, Valkenburg, & Peter, 2009). These items were included in a self-report questionnaire with additional questions about demography, Facebook activity, personality, and sleep habits. The questionnaire was distributed at undergraduate lectures in psychology at the University of Bergen, Norway, to engineering students at Bergen College, and students at the Royal Norwegian Naval Academy during the spring of 2011. Questionnaire completion took approximately 20 minutes. No monetary or other material incentives were offered in return for participation. Response rate was 95%. Questionnaires were coded with unique numbers that students were asked to note and keep for later re-administration of some of the questions. They were not informed which questions

would be re-administered. Three weeks after the first questionnaire was administered, the 18 items were re-administered to 36.2% of these undergraduates. Participants were asked to write the unique number code on the questionnaire for administrative use in identifying which students answered questions twice.

Measures

The Bergen Facebook Addiction Scale (BFAS).—This scale comprised 18 items, three for each of the six core features of addiction: salience, mood modification, tolerance, withdrawal, conflict, and relapse. Each item is scored on a 5-point scale using anchors of 1: Very rarely and 5: Very often. Higher scores indicate greater Facebook addiction. All 18 original items are listed in Appendix A (p. 516). Cronbach alpha was .83 in this sample.

The Facebook Attitude Scale.—This scale has six items for assessing attitudes toward Facebook. Each item is rated on a 5-point scale with anchors of 1: Strongly disagree and 5: Strongly agree. Higher scores then reflect positive attitudes toward Facebook (Ellison, Steinfield, & Lampe, 2007). Internal consistency (Cronbach alpha) was .82 in the present study.

The Online Sociability Scale.—This scale comprises five items, each pertaining to frequencies of different uses of Facebook (e.g., comment on other photographs, sending private messages). Scores are ratings on a 9-point scale using anchors of 1: Less than once per year and 9: More than once daily (Ross, *et al.*, 2009). High ratings reflect high frequency of Facebook use. Cronbach alpha of this scale was .63 in the present study.

The Addictive Tendencies Scale.—The scale (Wilson, *et al.*, 2010) has three items representing salience to, loss of control of, and withdrawal from Facebook use. Each item is rated on a 7-point scale, with anchors of 1: Strongly disagree and 7: Strongly agree. High ratings indicate high addictive tendencies. These items were from previous scales assessing addictive tendencies in use of text messages and instant messaging services (Ehrenberg, *et al.*, 2008). Cronbach alpha of this scale was .72 in the present study.

The NEO-Five Factor Inventory (NEO-FFI).—This is a short 60-item version of the NEO Personality Inventory-Revised, which provides a brief, comprehensive measure of the domains of the five-factor model of personality: Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness. Each subscale has 12 items rated on a 5-point scale (Costa & McCrae, 1992). Values of Cronbach alpha for the scales in the present study were .89 (Neuroticism), .80 (Extraversion), .74 (Openness), .71 (Agreeableness), and .82 (Conscientiousness).

The BIS/BAS scales.—The BIS scale assesses behavioral inhibition using seven items. Focus is on measuring predisposition to avoid threatening or punishing stimuli. The BAS scale of 13 items assesses predisposition to approach appetitive stimuli. There are three subscales: Reward

responsiveness (BAS-RR), Drive (BAS-D), and Fun-seeking (BAS-FS). Participants indicate how much they agree with statements on a 4-point scale using anchors of 1: Very false for me and 4: Very true for me (Carver & White, 1994). Internal consistencies (Cronbach alpha) of the scales in the present study were for BIS .79, BAS-RR .58, BAS-D .78, and BAS-FS .58.

Sleep questions.—Content concerned habitual bedtimes and rising times on weekdays and weekends, respectively. These questions have been used in previous research (Pallesen, Saxvig, Molde, Sørensen, Wilhelmssen-Langeland, & Bjorvatn, 2011) and seem to reflect the circadian rhythm of the participant (Bjorvatn & Pallesen, 2009). High numbers/scores indicate late bedtimes and rising times.

Analysis

Item selection.—Of the three items within each of the six core addiction elements, the one with the highest item-total correlation with the sum of ratings for all the other 17 items was retained. These analyses were conducted with PASW statistics, Version 18.0.

Factor analysis.—A one-factor solution was expected and investigated. The error term of each indicator was assumed to be uncorrelated with each of the others. The CFI and the RMSEA were used as fit indexes. As a rule of thumb, for a model with acceptable fit to the data, these indexes should be $< .08$ and $> .90$, respectively, whereas the corresponding values for a good fit would be $< .06$ and $> .95$, respectively (Hu & Bentler, 1999). Missing data were excluded pairwise. Pearson correlations among all items are shown in Appendix B (p. 517).

Correlations and regression analysis.—All other analyses were conducted using PASW, Version 18.0, unless explicitly stated otherwise. To investigate the test-retest reliability of responses to the BFAS, the Pearson product-moment correlation coefficient between ratings from the first administration and the re-administration of the scale was calculated. Score-Rel CI software was used to calculate the 95%CI for the test-retest correlation (Barnette, 2005). Pearson product-moment correlation coefficients were calculated to investigate the convergent validity between scores on the BFAS and on the Facebook Attitude Scale, the Online Sociability Scale, and the Addictive Tendencies Scale. A hierarchical multiple regression analysis was conducted to assess how ratings on the BFAS were related to the five-factor model of personality as well as to measures of the behavioral inhibition system and of the behavioral activation system. Participants' age and sex were entered in the first step. In the second step, the ratings for the five subscales (Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness) of the NEO Five-Factor Inventory were entered, as well as ratings from the four subscales of the BIS/BAS scales (the Behavioral Inhibition Scale and the Behavioral Approach Scales: Reward

Responsiveness, Drive, and Fun-seeking). Preliminary analyses were conducted to ensure there was no violation of the assumption of normality, linearity, multicollinearity, and homoscedasticity. Pearson product-moment correlations were calculated for the relations of the scores on the BFAS with responses to the sleep questions.

RESULTS

Factor Structure

The corrected item-total correlation coefficients for all initial 18 items are presented in Appendix A. The corrected item-total correlation coefficient of each of the six core addiction elements retained ranged from .60 to .73 (see Appendix A, p. 516). The confirmatory factor analysis showed that all standardized loadings of the six indicators on the one-factor solution ($\chi^2/df=1.84$, $p>.05$) were above .50 (range = .59 to .80; see Fig. 1). The RMSEA of the model was 0.05 (90%CI = 0.00, 0.08) and the CFI was .99. Cronbach alpha for the BFAS was .83 for the whole sample and .83 for the retest subsample. Comparing a model with no constraints to a model with constraints on the factor loadings across sexes indicated factor loading invariance ($\Delta\chi^2=8.86$, $df=5$, $p>.05$).

Test-retest Reliability

The 3-week test-retest correlation coefficient ($n=153$) was .82 ($p<.01$; 95%CI = .75, .86).

Convergent and Discriminative Validity

Table 1 shows the Pearson product-moment correlation coefficients among ratings on the BFAS, the Addictive Tendencies Scale, the Facebook

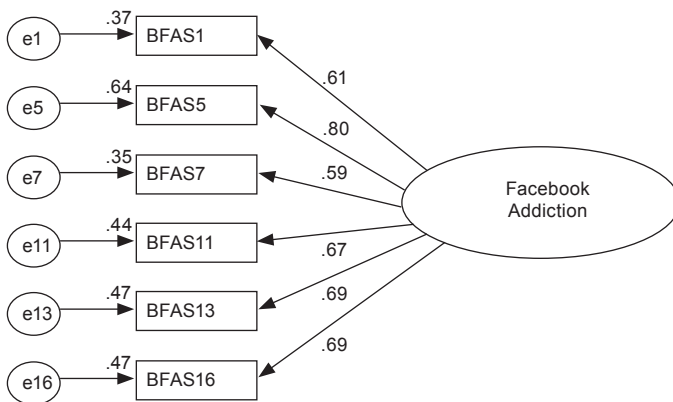


FIG. 1. Factor structure and standardized loadings of items in the Bergen Facebook Addiction Scale

TABLE 1
PEARSON PRODUCT-MOMENT CORRELATION COEFFICIENTS BETWEEN SCORES ON
BERGEN FACEBOOK ADDICTION SCALE, ADDICTIVE TENDENCIES SCALE,
FACEBOOK ATTITUDES SCALE, AND ONLINE SOCIABILITY SCALE

Scale	Addictive Tendencies Scale		Facebook Attitudes Scale		Online Sociability Scale	
	<i>r</i>	<i>n</i>	<i>r</i>	<i>n</i>	<i>r</i>	<i>n</i>
Bergen Facebook Addiction Scale	.69	403	.58	397	.37	400
Addictive Tendencies Scale			.69	397	.45	400
Facebook Attitudes Scale					.51	395

Note.—All *ps* < .01.

Attitudes Scale, and the Online Sociability Scale. The BFAS correlated positively and significantly with all of these scales. The correlation coefficient between ratings on the BFAS and on the Addictive Tendencies Scale was statistically significantly higher than the correlation coefficient between the BFAS and the Facebook Attitudes Scale ($\Delta r = .11$, $t = 3.84$, $df = 394$, $p < .01$) and between the BFAS and the Online Sociability Scale ($\Delta r = .31$, $t = 8.22$, $df = 394$, $p < .01$).

Relations with Five-factor Model of Personality and Reward Sensitivity

In Table 2 is a summary of results from the regression analysis predicting scores on the BFAS. Participants' age and sex were entered at Step 1,

TABLE 2
SUMMARY OF HIERARCHICAL REGRESSION ANALYSIS FOR VARIABLES PREDICTING
SCORES ON BERGEN FACEBOOK ADDICTION SCALE (*N* = 386)

Predictor		β	<i>t</i>	ΔR^2
Step 1				.123
Sex (male = 1, female = 2)		.30†	6.22	
Age		−.12*	−2.48	
Step 2				.145
Sex (male = 1, female = 2)		.25†	4.69	
Age		−.08	−1.70	
Neuroticism		.25†	4.01	
Extraversion		.22†	3.79	
Openness to experience		−.05	−1.15	
Agreeableness		−.04	−0.79	
Conscientiousness		−.23†	−4.47	
Behavioral Inhibition (BIS)		.13	1.95	
Behavioral Approach–Reward responsiveness (BAS–RR)		.03	0.54	
Behavioral Approach–Drive (BAS–D)		.05	0.82	
Behavioral Approach–Fun-seeking (BAS–FS)		−.11*	− 2.06	

**p* < .05. †*p* < .01.

explaining 12.3% of the variance. After entering the scores for the five subscales of the NEO-Five Factor Inventory and the scores for the BIS/BAS Scales, the total variance explained by the model as a whole was 26.8% ($F_{11,375} = 12.5, p < .01$). The personality variables entered at Step 2 explained an additional 14.5% of the variance in scores on the BFAS, after controlling for age and sex (R^2 change = .15, F change_{9,375} = 8.3, $p < .01$). In the final model, scores on the BFAS were statistically significantly and positively related to sex (coded men = 1, women = 2). Neuroticism and Extraversion were statistically significantly and positively related to the ratings on the BFAS, whereas Conscientiousness was negatively related. Ratings on the BAS Fun-seeking subscale were negatively and statistically significantly related to ratings on the BFAS. The five significant variables explained a total of 23.7% of the variance.

Facebook Addiction and Sleep Parameters

Table 3 shows the Pearson product-moment correlation coefficients by ratings on the BFAS with bedtimes and rising times on weekdays and weekends, respectively. Values were all statistically and positively significant.

TABLE 3
PEARSON PRODUCT-MOMENT CORRELATION COEFFICIENTS BETWEEN SCORES ON BERGEN
FACEBOOK ADDICTION SCALE AND FOUR SLEEP PARAMETERS (N = 403 TO 423)

	Bedtime Weekdays	Bedtime Weekends	Rising Time Weekdays	Rising Time Weekends
Bergen Facebook Addiction Scale	.11	.17	.26	.17
Bedtime weekdays		.53	.47	.46
Bedtime weekends			.31	.55
Rising time weekdays				.46

Note. $-r = .11, p < .05$; $.17 \leq r \leq .55, p < .01$.

DISCUSSION

The first hypothesis was that the BFAS would have a unidimensional factor structure. All loadings were above .50. The CFI was above .95 and the RMSEA was below .06, which both indicate a good fit (Hu & Bentler, 1999). Confirmatory factor analysis, as used in the present study, seems to afford a stricter interpretation of unidimensionality than can be provided by more traditional methods (Gerbing & Anderson, 1988). In addition, the results showed that there was no difference between males and females in terms of the factor loadings of the model, hence factor loading invariance across the sexes was demonstrated. Thus, the first hypothesis was supported.

The second hypothesis concerned the test-retest reliability of the scale,

which in this case was .82 for re-administration after 3 weeks. The lower end of the 95%CI for the test-retest correlation coefficient was also within the expected value ($>.75$). Thus, the second hypothesis was also supported.

The third hypothesis implied that the scores for the BFAS would be highly correlated, specifically with Facebook measures of addictive tendencies, attitudes, and online sociability. As the scores were positively correlated with all the other Facebook scales and were related significantly higher with the Addictive Tendencies scale than with scores on the Facebook Attitudes Scale and the Online Sociability Scale, one may infer the BFAS showed good convergent and discriminative validity (Carmines & Zeller, 1979). Scores on the BFAS correlated higher with scores reflecting problematic Facebook use than scores reflecting general use and general attitudes toward Facebook. This indicates that the BFAS primarily measures misuse and not general use of Facebook, therefore, Hypothesis 3 was supported.

Before the findings concerning Hypotheses 4 and 5 are discussed, some comments regarding demographic variables which were significantly related to BFAS are warranted. In the regression analysis, women had higher scores than men on the BFAS, a finding counter to prior sex differences related to other behavioral addictions, such as pathological gambling (Molde, Pallesen, Bartone, Hystad, & Johnsen, 2009) and video-game addiction (Mentzoni, Brunborg, Molde, Myrseth, Skouverøe, Hetland, *et al.*, 2011). However, other researchers have reported women to have higher frequency than men of other behavioral addictions, such as mobile-phone addiction (Takao, Takahashi, & Kitamura, 2009). This may allow the inference that men are more prone to become addicted to solitary behaviors, whereas women tend to score higher on measures of behavioral addiction involving social interaction.

Hypothesis 4 implied that ratings on BFAS would be positively related to those on Neuroticism and Extraversion, and negatively related to those on Conscientiousness. Ratings on the Neuroticism subscale were positively related to scores on the BFAS, consistent with studies of other behavioral addictions (Myrseth, Pallesen, Molde, Johnsen, & Lorvik, 2009), including Internet addiction (Tsai, Cheng, Yeh, Shih, Chen, Yang, *et al.*, 2009). In relation to social media, it has been suggested that anxious people may use social media to obtain support and company (Correa, *et al.*, 2010). A further hypothesis is that shy and anxious people may prefer to interact on the web rather than face-to-face, since the former allows more time for planning and rehearsal than the latter (Ehrenberg, *et al.*, 2008). The hypothesis concerning Neuroticism was supported. Extraversion was also positively correlated with scores on the BFAS, which is

in line with Ross, *et al.* (2009) who suggested that those scoring high on extraversion do not use Facebook as a substitute for social interaction but rather as an additional way of expressing themselves. Conscientiousness was expected to be negatively associated with scores on the BFAS, and this was supported by the data. This finding is in line with studies on heavy Facebook use (Wilson, *et al.*, 2010) as well as with studies on Internet addiction (Gnisci, Perugini, Pedone, & Di Conza, 2010). This suggests people with high scores on this trait give less priority to activities such as Facebook in order to fulfill other obligations and meet deadlines for tasks they have undertaken.

Hypothesis 5 stated that ratings on the BFAS would be positively associated with ratings on the Behavioral Approach (BAS) subscales. The only significant finding concerning the BIS/BAS scale was that the scores of the BAS Fun-seeking subscale were negatively related to the scores on the BFAS. This result contradicted the hypothesis, and was contrary to findings from a previous study that showed that the scores on this subscale were positively related to Internet addiction (Yen, *et al.*, 2009). The authors do not have any clear-cut explanation for this unexpected finding, but one reason could be that people who score high on Fun-seeking may regard Facebook as "old news," which does not provide much fun and novelty.

The final and sixth hypothesis was that the scores on the BFAS would be positively related to bedtimes and rising times on both weekdays and weekends. This hypothesis was supported, which indicates that heavy Facebook use may interfere with going to bed, and as such, leads to a postponement of both bedtimes and rising times. This interpretation is in line with previous studies showing that people who use computers in their bedrooms and/or late in the evening typically have a delayed sleep-wake rhythm (Suganuma, *et al.*, 2007; Brunborg, *et al.*, 2011).

In terms of limitations it should be noted that the BFAS, so far, only has been investigated in a student sample. Thus, further studies investigating the psychometric properties of the BFAS in other populations are warranted. Some of the scales used for validation of the BFAS in the present study had low internal consistency, which may have caused underestimation of relationships between concepts. The wording of several items of the BFAS may seem strikingly similar to scales assessing other behavioral addictions, such as the Exercise Addiction Inventory (Terry, Szabo, & Griffiths, 2004). This similarity does not reflect plagiarism, but the fact that the scales were based on the same basic addiction criteria (Brown, 1993; Griffiths, 1996, 2005).

The authors conclude that, as a new scale for measuring Facebook addiction, the BFAS has acceptable psychometric properties in terms of

internal consistency, factor structure, and reliability, as well as in relation to content and convergent and discriminative validity. As expected, the scores on the BFAS relate to specific factors (Neuroticism, Extraversion, and Conscientiousness) in the five-factor model of personality. The relationship between the scores on the BFAS and scores on measures of reward and punishment sensitivity was not as expected, however. The scores on the BFAS were related to sleep in such a way that higher scores on the BFAS were associated with later bedtimes and rising times.

The authors suggest that the BFAS can be used in epidemiological as well as clinical settings. The present study did not examine specific cutoff scores for a categorization of problems with Facebook addiction. However, in line with studies assessing other behavioral addictions (Lemmens, *et al.*, 2009), a liberal approach would entail the use of a polythetic scoring scheme (e.g., scoring 3 or above on at least four of the six items), whereas a more conservative approach could be to use a monothetic scoring key (e.g., scoring 3 or above on all six items). The usefulness of the proposed cutoff value for categorization of Facebook addiction should be pursued in future studies. The authors would like to point out, for most addictions, a categorization (or tentative diagnosis) is normally made when the person fulfils a given number (e.g., five of 10 for pathological gambling, three of seven for substance dependence) of criteria (American Psychiatric Association, 2000).

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APPENDIX A

THE BERGEN FACEBOOK ADDICTION SCALE:
ITEMS AND INTERCORRELATIONS OF RATINGS

How often during the last year have you ...

		Item-total Correlation
Salience		
BFAS1*	Spent a lot of time thinking about Facebook or planned use of Facebook?	.61
BFAS2	Thought about how you could free more time to spend on Facebook?	.42
BFAS3	Thought a lot about what has happened on Facebook recently?	.55
Tolerance		
BFAS4	Spent more time on Facebook than initially intended?	.68
BFAS5*	Felt an urge to use Facebook more and more?	.73
BFAS6	Felt that you had to use Facebook more and more in order to get the same pleasure from it?	.57
Mood modification		
BFAS7*	Used Facebook in order to forget about personal problems?	.60
BFAS8	Used Facebook to reduce feelings of guilt, anxiety, helplessness, and depression?	.55
BFAS9	Used Facebook in order to reduce restlessness?	.52
Relapse		
BFAS10	Experienced that others have told you to reduce your use of Facebook but not listened to them?	.61
BFAS11*	Tried to cut down on the use of Facebook without success?	.68
BFAS12	Decided to use Facebook less frequently, but not managed to do so?	.62
Withdrawal		
BFAS13*	Become restless or troubled if you have been prohibited from using Facebook?	.69
BFAS14	Become irritable if you have been prohibited from using Facebook?	.59
BFAS15	Felt bad if you, for different reasons, could not log on to Facebook for some time?	.58
Conflict		
BFAS16*	Used Facebook so much that it has had a negative impact on your job/studies?	.66
BFAS17	Given less priority to hobbies, leisure activities, and exercise because of Facebook?	.60
BFAS18	Ignored your partner, family members, or friends because of Facebook?	.51

*Items retained in the final model/scale. All items are scored on the following scale: 1: Very rarely, 2: Rarely, 3: Sometimes, 4: Often, 5: Very often.

APPENDIX B

MEANS, STANDARD DEVIATIONS, AND PEARSON CORRELATION COEFFICIENTS
FOR ITEMS OF BERGEN FACEBOOK ADDICTION SCALE (*N* = 405)

Scale Item	<i>M</i>	<i>SD</i>	5	7	11	13	16
1	1.99	1.02	.51	.34	.37	.47	.37
5	2.10	1.01		.48	.50	.54	.56
7	1.48	0.80			.43	.40	.38
11	1.54	0.95				.46	.51
13	1.65	0.85					.45
16	1.78	0.97					