# The interplay of intrinsic need satisfaction and Facebook specific motives in explaining addictive behavior on Facebook

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## ARTICLE INFO

## ABSTRACT

The present paper aims at exploring the new phenomenon of social network site (SNS) addiction and at identifying predictors of problematic SNS use. For this purpose, a scale measuring addictive behavior specifically with regard to SNS use was developed. The effects of intrinsic need satisfaction in the offline context and of SNS-specific motives on SNS addiction were tested in an online-survey among 581 SNS users in Germany. It was hypothesized that motives mediate the influence of thwarted intrinsic need satisfaction on addictive behavior on SNSs. More precisely, we assumed that a lack of autonomy leads to a higher motivation to use SNSs for self-presentation and escapism, a lack of competence predicts the motive to use SNSs for acquiring information and self-presentation, and a lack of relatedness fosters users' motives to use SNSs for self-presentation and meeting new people. These motives, in turn, were predicted to be associated with higher levels of SNS addiction. All proposed mediation models were supported by the data. The results emphasize the importance of incorporating both offline need satisfaction and gratifications sought through the use of SNS to provide a comprehensive perspective on addictive behavior on SNSs.

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## 1. Introduction

Using social network sites (SNSs) has become an integral part of the daily routine for many people around the world. Through these platforms, users are offered a variety of possibilities to post and share information, photos, and videos about themselves, others, their feelings, and their interests. At the same time, SNSs enable users to communicate via status updates, wall posts, or private messages and to seek a wide range of gratifications (Joinson, 2008; Papacharissi & Mendelsohn, 2011; Smock, Ellison, Lampe, & Wohn, 2011). Results of a recent survey conducted by the Pew Research Center (2013) demonstrate that the use of SNSs has continuously increased since 2005. By now, almost three quarters of American adults use some type of SNS. The same usage pattern can be seen in other countries. In Germany for example, 78% of the Internet users between 12 and 19 years use platforms such as Facebook on a daily basis (MPFS, 2012). Just recently, Facebook reported to have more than one billion active users (Facebook, 2013), hence making it the largest SNS worldwide. As more and more people register on these platforms, a growing number of researchers have started to address the question whether originally unproblematic forms of SNSs usage may eventually become compulsive. As Greenfield (1999) denotes, the Internet and its applications may particularly enhance addictive behaviors as "the combination of stimulating content, ease of access, convenience, low cost, visual stimulation, autonomy (...) all contribute to a highly psychoactive experience" (p. 2). Until now, however, research on addictive behavior on SNSs has remained scarce. So far, most scholars in this field have investigated the somewhat broader and unspecific phenomenon of *Internet addiction* (Beard & Wolf, 2001; Caplan, 2002; Davies, Flett, & Besser, 2002; Hahn & Jerusalem, 2010; Kim & Haridakis, 2009; Meerkerk, Van Den Eijnden, Vermulst, & Garretsen, 2009; Young, 1996; Young, 1998, 2009). As Griffiths (1999) has criticized, however, the concept of Internet addiction does not determine a clear object of the addiction. It remains unclear whether an individual classified as an '*Internet addict*' is addicted to the medium of communication, the information obtained or to specific applications or contents (Griffiths, 1999). Looking at the variety of possible Internet activities and applications today, there is a need for more specific

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concepts when examining online addictions. Reliable instruments to measure these diverse online addictions are still lacking.

The research presented here aims at complementing existing attempts to conceptualize addictive behavior on SNSs. Due to the interactive dynamics of the social web and the corresponding possibilities to satisfy specific needs such as self-presentation, entertainment, socializing, or escapism (Papacharissi & Mendelsohn, 2011) SNS users might be particularly at risk of becoming addicted (Kuss & Griffiths, 2011). Accordingly, our first goal was to develop a psychometrically sound scale to measure addictive SNS usage. However, scales assessing addictive behavior only measure the existence of specific addiction symptoms and enable researchers to classify users in terms of their addiction level. They cannot explain which factors may enhance or reduce addictive behavior. Based on prior research, two theory-based approaches can be differentiated. Some studies have found a strong impact of specific motives on addictive behavior on the Internet, suggesting that people become addicted because they seek specific gratifications through the use of the respective medium (Chen & Kim, 2013; Kim & Haridakis, 2009; Song, Larose, Eastin, & Lin, 2004). Other scholars have investigated the relationship between offline well-being, represented for example by intrinsic need satisfaction, and obsessive behavior (Przybylski, Weinstein, Ryan, & Rigby, 2009; Ryan, Rigby, & Przybylski, 2006; Sheldon, Abad, & Hinsch, 2011). A theoretical link between both approaches has not yet been established. In the current paper, we postulate that the interplay of both intrinsic need satisfaction in the offline domain and gratifications sought online through the use of SNSs might explain why some users become addicted to SNSs. We argue that people try to compensate thwarted intrinsic needs in their offline lives through the use of Facebook by gratifying corresponding needs online. The rewarding experience of obtaining these gratifications in the SNS context, in turn, might become compulsive and cause SNS addiction. More specifically, we assume that motives of SNS use mediate the influence of intrinsic need satisfaction on SNS addiction. The present study thus extends prior research by incorporating both offline need satisfaction and gratifications sought in the online context to provide a comprehensive theoretical understanding of addictive behavior on SNSs. For consistency, we have limited the focus of the present study on the use of Facebook, as it is the most popular SNS both in Germany (Statista, 2013) and in many countries around the world (Statista, 2012).

## 2. Theoretical background

### 2.1. Addictive behavior online

With the growing relevance of the Internet as an omnipresent tool for interaction, communication, and knowledge acquisition, scholars have shaped the term 'Internet addiction' (Griffiths, 1999; Young, 1996, 1998) to describe problematic forms of Internet use, arguing that some forms of behavioral addictions do not necessarily include substance abuse (Greenfield, 1999; Griffiths, 1999; Young, 1996). Contrary to substance-related addictions and some behavioral disorders (e.g., pathological gambling), however, no consensus exists on a clear definition of Internet addiction and related phenomena like online gaming addiction and SNS addiction. These new forms of addictive media use are not yet recognized as psychological disorders in official diagnostic manuals, such as the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; American Psychiatric Association, 2013).

First attempts to define and explore online addiction date back almost two decades. Among the first researchers in this area, Kimberly Young started to critically and systematically examine the phenomenon of Internet addiction in diverse studies (Young, 1996, 1998). Analogously to pathological gambling (as specified by the DSM-IV), Young defined Internet addiction as an impulse-control disorder and adopted modified criteria for pathological gambling to develop a first diagnostic screening instrument (Young, 1998). Since then, many instruments and psychometric scales have been developed in order to measure Internet addiction (Beard & Wolf, 2001; Caplan, 2002; Davies et al., 2002; Hahn & Jerusalem, 2010; Meerkerk et al., 2009). Although the existing measures show considerable variance in their specific definition of Internet addiction, a number of central defining criteria for Internet addiction can be distinguished: (1) a loss of control over the frequency and duration of usage and unsuccessful attempts to reduce the time spent online; (2) a continuous increase of usage time; (3) withdrawal symptoms such as nervousness, dissatisfaction, anxiety, and aggressiveness when the possibility to use the Internet is limited or after a longer interruption, along with a generally strong desire ("craving") to use the Internet; and (4) negative consequences of excessive Internet use on social relations and work performance (e.g., due to distraction and disregard). Accordingly, the measurement of Internet addiction is based on the assessment of these specific symptoms.

Scholars have criticized that Internet-induced psychopathologies manifest themselves very differently and the term Internet addiction "may already be obsolete" (Griffiths, 2012). They suggest examining problematic uses of different applications within the Internet separately. Concerning SNS addiction, more and more cases of anecdotal evidence seem to support this assumption, as people complain about spending too much time on SNSs or getting distracted from work due to their SNS use. Karaiskos, Tzavellas, Balta, and Paparrigopoulos (2010), for example, have described the case of a young Greek woman who spent more than 5 h per day checking her Facebook profile and consequently lost her job due to excessive Facebook use. Furthermore, a recent study by Rosen, Mark Carrier, and Cheever (2013) reveals that Facebook use can interfere with academic performance.

In accordance with recent calls for a more specific view on the addictive use of specific Internet applications (Griffiths, 1999, 2012) and preliminary evidence of the problematic potential of SNS use (Karaiskos et al., 2010; Kesici & Sahin, 2010; Kittinger, Correia, & Irons, 2012), the present study is focused on excessive Facebook use. To date, only a small number of scholars have examined addictive behavior on SNSs in specific (Andreassen, Torsheim, Brunborg, & Pallesen, 2012; Chen & Kim, 2013; Cock et al., 2013; Kittinger et al., 2012; Wilson, Fornasier, & White, 2010). Whereas Andreassen et al. (2012) developed a short six-item scale to measure Facebook addiction, Chen and Kim (2013) adapted the 20-item Internet addiction scale by Young (1998) with respect to the SNS context. A generally accepted scale is not yet available. Consequently, the first goal of the present study is to provide a reliable and valid psychometric measure of Facebook addiction. This measure will be presented in the method section.

The second central aim of the present research was to identify predictors of SNS addiction. In the following section, we will first introduce the satisfaction of three intrinsic needs identified in self-determination theory (Ryan & Deci, 2000) as a first set of influencing factors on Facebook addiction. Subsequently, we will refer to the uses and gratification approach (Katz, Gurevitch, & Haas, 1973) and identify different motives for the usage of SNSs as a second theoretical foundation in order to explain SNS addiction.

### 2.2. Intrinsic need satisfaction

Self-determination theory (Ryan & Deci, 2000) posits that people have inherent growth tendencies and innate psychological needs which constitute the basis for their motivation, behavior, and psychological well-being (Ryan, 1995; Ryan & Deci, 2000). According to that theory, people seek to satisfy three intrinsic needs: the need

for autonomy (a feeling of volition and the absence of external pressures), the need for competence (the capacity to act effectively and the feeling of pursuing something meaningful), and the need for relatedness (a feeling of closeness and connectedness with others). High satisfaction of these intrinsic needs is strongly correlated with psychological health and well-being and fosters effective self-regulation (Ryan, 1995). Four studies conducted by Ryan et al. (2006) demonstrate that thwarted intrinsic needs can be satisfied through media use. It was argued that media can provide users with specific gratifications which may compensate for lower need satisfaction. Focusing specifically on obsessive video game play, Przybylski et al. (2009) were able to show that high levels of basic psychological need satisfaction were positively related to harmonious passion for video game play, whereas low levels were associated with obsessive passion for video game play. The scale measuring obsessive passion for video game play included several symptomatic characteristics of gaming addiction. Although the direct effect was marginal, it nonetheless implies that people with low levels of intrinsic need satisfaction might try to overcome these shortcomings through media use—in this case obsessive video game playing. A study by Sheldon et al. (2011) examined explicitly whether Facebook use promotes a higher satisfaction concerning relatedness. The results demonstrate that using Facebook can cause higher levels of perceived relatedness. Using Facebook thus presents a coping strategy that may allow for the compensation of thwarted relatedness need satisfaction in the offline context. Low levels of relatedness in daily life seem to lead to increased Facebook usage, whereas greater usage, in turn, correlates with a feeling of relatedness. Furthermore, recent research by Reinecke, Vorderer, and Knop (2014) demonstrates that, in addition to relatedness need satisfaction, the use of Facebook can also satisfy intrinsic needs for competence and autonomy. In line with this reasoning, it seems plausible to assume that people try to compensate unmet intrinsic needs by expected gratifications derived from media use and that these expectations might lead to excessive and addictive usage. In the following, we will adapt a uses and gratifications perspective to incorporate expected gratifications into the proposed model.

## 2.3. Motives of SNS use

The uses and gratifications approach (U&G; Katz et al., 1973) postulates that users actively choose media stimuli in order to fulfill specific needs. The U&G perspective allows explaining user's goals when engaging with media and thus permits to describe media selection processes. U&G studies consequently explore the types of gratifications people seek by using specific media (Katz et al., 1973). Ruggiero (2000) emphasized the importance of the U&G perspective for studying social media. As new technologies confront users with a greater variety of media choices, the expected satisfaction of specific needs becomes a crucial component of their motivation to use a specific medium (Joinson, 2008; Ruggiero, 2000). Consequently, a number of scholars have used the U&G paradigm in order to understand why people use SNSs and to discover which type of motives are associated with their use (Baumgarner, 2007; Chen & Kim, 2013; Joinson, 2008; Kim & Haridakis, 2009; Kneidinger, 2010; Lampe, Wash, Velasquez, & Ozkaya, 2010; Papacharissi & Mendelsohn, 2011; Smock et al., 2011). These previous studies have identified a number of basic motive dimensions for using SNSs: entertainment (Kim & Haridakis, 2009; Papacharissi & Mendelsohn, 2011), information-seeking (Chen & Kim, 2013; Kneidinger, 2010; Leung, 2010), self-presentation (Chen & Kim, 2013; Papacharissi & Mendelsohn, 2011), escapism (Chen & Kim, 2013; Kim & Haridakis, 2009; Papacharissi & Mendelsohn, 2011), socializing (Chen & Kim, 2013; Joinson, 2008), and meeting new people (Chen & Kim, 2013; Papacharissi & Mendelsohn, 2011) feature most prominently among the identified motives.

In addition to exploring different motivations to use Facebook, a study by Joinson (2008) further demonstrates that motives were able to predict the frequency of Facebook use. The results suggest that people return to use Facebook in order to satisfy the same needs again and again. Taking this finding a step further, it appears plausible that this continuing gratification-seeking might slowly turn into compulsive usage patterns as people continuously experience gratifications which further reinforce and intensify their Facebook use.

Referring to this reasoning, a number of studies have investigated what type of motives and gratifications predict Internet addiction and more recently SNS addiction, respectively. Song et al. (2004) were able to show that seeking a virtual community, information, entertainment, and relationship maintenance were positively related to Internet addiction. Kim and Haridakis (2009) found that different usage motives relate to different symptoms of Internet addiction. In their study, seeking excitement, for example, positively predicted the level of intrusion and attachment to the Internet. A recent study by Chen and Kim (2013) specifically examined the influence of the gratifications of SNSs on pathological SNS usage. The authors found that the motive for self-presentation and for relationship building significantly predicted problematic SNS use (Chen & Kim, 2013). These findings suggest that usage motives can be crucial factors in explaining SNS addiction.

## 2.4. The present research

Based on the research discussed above, we propose that the interplay of intrinsic need satisfaction in the offline context and the motives of SNS use is a crucial driver of SNS addiction. Referring to the rational presented above, we argue that people experiencing shortcomings in intrinsic need fulfillment in their daily offline-lives try to compensate for these deficits online through the gratifications of SNS use. This attempt to escape into a virtual world might escalate to a pathological usage pattern.

We further propose that the thwarted satisfaction of the three intrinsic needs identified in self-determination theory can systematically be linked to specific motivations for SNS use. The need for *autonomy* refers to feelings of volition and freedom of choice (Ryan & Deci, 2006). The level of perceived autonomy is reduced if an individual feels that he or she is not able to act or to think free of external pressures and influences. The opposite condition, *heteronomy*, refers to "regulation outside of the phenomenal self, by forces experienced as alien or pressuring, be they inner impulses or demands, or external contingencies of reward and punishment" (Ryan & Deci, 2006, p. 1562). Consequently, if people experience low levels of autonomy and feel pressured or regulated by others, they feel an urge to restore their autonomy. In its purest form, a low level of autonomy will thus foster the need to escape from social constraints or external pressures. However, autonomy also refers to being able to present oneself authentically and act in accordance with one's "true self" (Kernis & Goldman, 2006). As research on motives of SNS use has demonstrated, social media platforms such as Facebook can provide such possibilities for distraction (Papacharissi & Mendelsohn, 2011) and authentic self-presentation (Reinecke & Trepte, 2014). We thus postulate that a low level of autonomy is associated with a higher motivation to use SNSs for reasons of escapism and self-presentation. In line with the studies presented above, these motives may in turn predict addictive SNS usage. We thus propose that the effect of autonomy on SNS addiction is mediated by the motives for self-presentation and escapism.

**Hypothesis 1.** The level of perceived autonomy in daily life is negatively related to the motives for self-presentation and escapism which, in turn, are positively related to SNS addiction (mediation H1).

The need for *competence* refers to a feeling of effectiveness and capability and is satisfied by optimal challenges and positive feedback (Ryan, 1995). We suggest that the influence of low levels of perceived competence on motives of SNS use can be twofold: A feeling of low competence could be compensated by gaining knowledge. Information-seeking can be a strong motivator for SNS use (Chen & Kim, 2013; Leung, 2010) and thus may present a possibility to restore thwarted competence need satisfaction. However, SNSs may also provide the potential to portray oneself as a competent and effective person. Posting status updates, constructing a positive self-presentation by demonstrating one's abilities, and receiving direct feedback from SNS friends may thus support higher levels of perceived competence. We thus assume that the effect of competence on SNS addiction is mediated by the motives for information-seeking and self-presentation.

**Hypothesis 2.** The level of perceived competence in daily life is negatively related to the motives for information-seeking and self-presentation which, in turn, are positively related to SNS addiction (mediation H2).

The last intrinsic psychological need identified in self-determination theory, *relatedness*, is characterized by a need for belonging, closeness, and intimacy with other people (Ryan & Deci, 2000). The individual's need to create and maintain interpersonal relationships is innate to all human beings (Baumeister & Leary, 1995). We propose that SNSs provide numerous opportunities to overcome deficits in relatedness need satisfaction: As a number of studies have demonstrated, social gratifications such as companionship and social interaction (Papacharissi & Mendelsohn, 2011; Smock et al., 2011), caring for others (Kim & Haridakis, 2009) or relationship maintenance (Chen & Kim, 2013) are important reasons for using SNSs once a network has been established. Furthermore, SNSs provide the opportunity to meet new people. A growing body of research reveals that SNSs such as Facebook are used to form and maintain social capital (Ellison, Steinfield, & Lampe, 2007; Steinfield, Ellison, & Lampe, 2008; Valenzuela, Park, & Kee, 2009). In the study by Valenzuela et al. (2009), the authors found that using Facebook was associated with well-being and suggest that using Facebook might provide benefits for users experiencing low life satisfaction. Shy or introverted individuals might find it easier to present themselves more effectively on SNSs and accordingly perceive SNS profiles as a chance to introduce themselves to others effectively (Steinfield et al., 2008). Again, these gratifications sought from SNS use might become compulsive and lead to problematic SNS usage patterns. Hence, the motives for self-presentation and for meeting new people are predicted to mediate the effect of relatedness on SNS addiction.

**Hypothesis 3.** The level of perceived relatedness in daily life is negatively related to the motives for self-presentation and for meeting new people which, in turn, are positively related to Facebook addiction (mediation H3).

Based on the theoretical analysis and the three hypotheses presented above, we developed three mediation models which incorporate intrinsic offline needs and SNS-specific motives in order to explain SNS addiction (cf. Fig. 1).

## 3. Method

### 3.1. Sample and procedure

The data presented here was collected in an online survey conducted in Germany in July 2012. The study's link was distributed via e-mail to the Socio-Scientific Panel (Leiner, 2012), a panel of German Internet users who volunteered to take part in scientific online-surveys. A total of $N = 806$ participants responded to the survey. 225 participants had to be excluded, either due to missing data or because the respondents did not have a Facebook account. The analyses reported below are based on the remaining 581 participants (67.1% female, $M_{age}$ = 28.84 years, $SD$ = 10.76). Although the sample is not representative for the general population of German Internet users, the age distribution resembled the targeted population of all Facebook users in Germany (allfacebook.de, 2013). However, females were slightly overrepresented. Most participants in the sample used Facebook on a daily basis (13.4%) or even several times a day (64.3%). On a normal day, the average time they spent on Facebook was $M$ = 47.85 min ($SD$ = 57.01 min). The majority of the participants were pupils or university students (57.3%) at the time of the survey. One third of the sample consisted of employees (37.8%). Completion of the survey took approximately 15 min.

### 3.2. Measures

#### 3.2.1. SNS addiction

An adapted version of the Internet Addiction Scale by Hahn and Jerusalem (2010) was used to measure SNS addiction. The wording of the 20 items of the original scale was modified to fit the context of SNS usage, in this case Facebook in specific. The items cover the five central dimensions of addiction (for an overview see Table 1): loss of control (e.g., "I often spent more time on Facebook then I intended"), tolerance (e.g., "The amount of time that I spent on Facebook has continuously increased"), withdrawal syndrome (e.g., "When I am not online, I often ask myself what happens on Facebook"), negative consequences for social relations (e.g., "Since I am using Facebook, some friends have withdrawn from me"), and negative outcomes for work and performance (e.g., "My concentration at work/school/university suffers because of Facebook"). Each dimension is measured with four items to which Participants responded on a 5-point Likert scale ranging from 1 "*strongly disagree*" to 5 "*strongly agree*".

The factor structure of the scale was tested with a confirmative factor analysis using structural equation modeling. To test the model fit, we applied the following criteria: First, as a general rule, Marsh and Hocevar (1985) postulated that a good model fit is given if the value of $\chi^2$ divided by the degrees of freedom (CMIN/$df$) does not exceed a value of 5. Second, according to Browne and Cudeck (1992), the root mean square error of approximation (RMSEA) should not exceed values of .08. Third, Hu and Bentler (1999) suggest that together with a standardized root mean square of residuals (SRMR) of .06, the Tucker Lewis index (TLI) and the comparative fit index (CFI) should not fall below .90.

Based on the combination of these criteria, the first model did not show a satisfactory fit ($\chi^2$ (165) = 872.14, $p < .000$; CMIN/$df$ = 5.29; CFI = .86; TLI = .84; RMSEA = .09, 90% confidence interval (CI) [.08, .09]; SRMR = .07), suggesting the need for modifications of the measurement model. After examination of the modification indices, two small changes were made which produced an adequate fit to the model: Two items did not load on their respective factors and showed unintended cross-loadings to other factors. The item "I often feel a strong desire to use Facebook" loaded strongly on the factor *withdrawal syndrome* and was hence excluded from the *tolerance* subscale. Furthermore, the item "I sometimes miss dates or I am too late because of Facebook", which was originally intended to measure *negative consequences for work and performances,* also loaded strongly on the factor *negative consequences for social relations* and was thus also excluded from the scale (cf. Fig. 2 for the factor structure and factor loadings of the final model). After these modifications, the model fit indices improved significantly and the factor structure showed an adequate fit
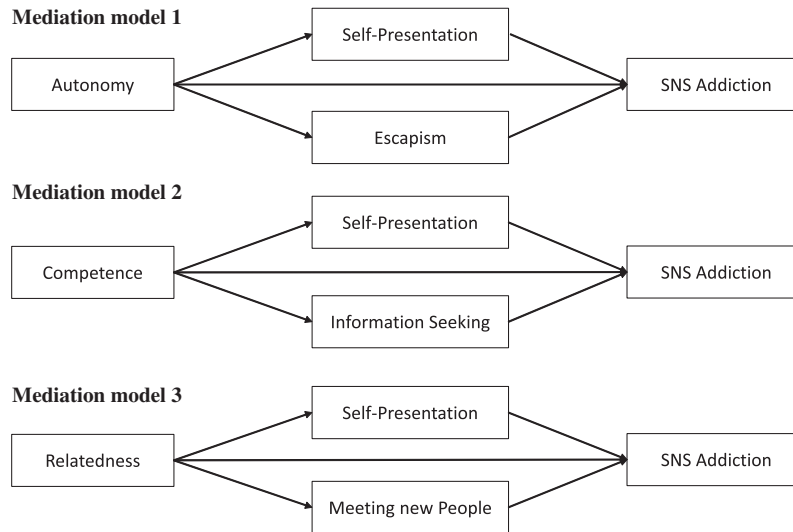
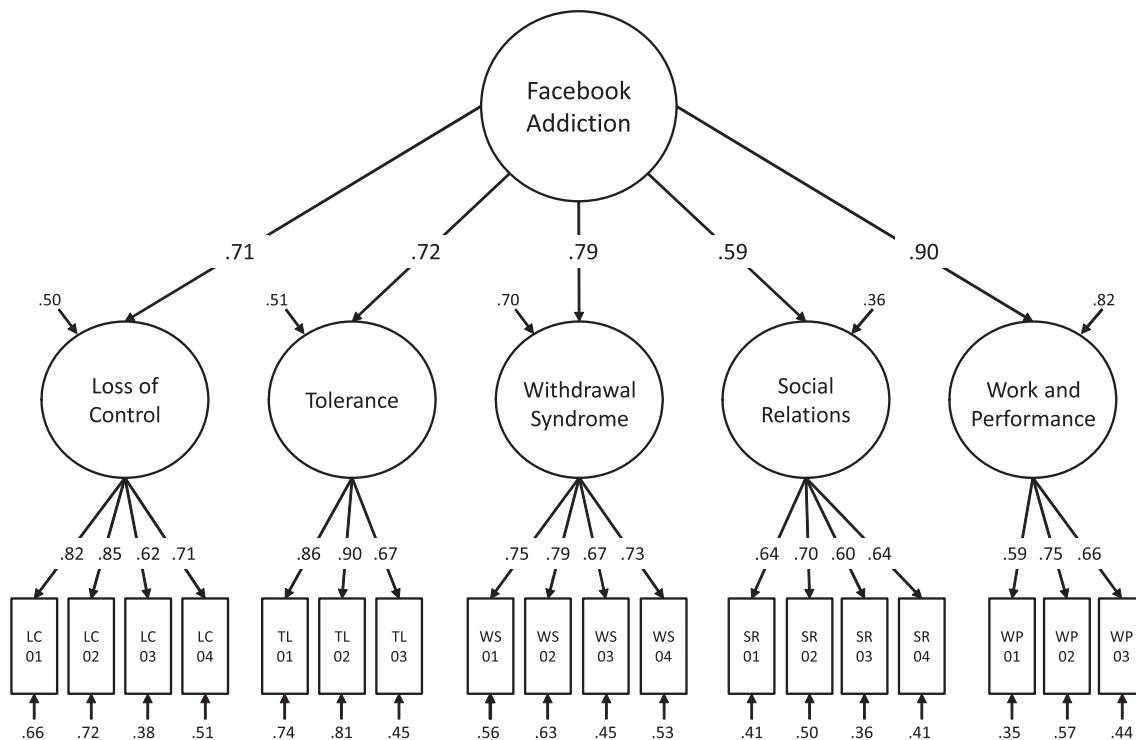**Fig. 1.** Proposed parallel multiple mediation models.



**Fig. 2.** Confirmatory factor analysis of the 18 items of the Facebook addiction scale. All indicators are significant at $p < .001$.

($\chi^2$ (130) = 465,77, $p < .000$; CMIN/$df$ = 3.58; CFI = .92; TLI = .91; RMSEA = .07, 90% CI [.06, .07]; SRMR = .06). Furthermore, each dimension showed acceptable internal consistencies (see Table 1). However, in the following analyses we did not analyze differences within each factor of the scale. Instead, we treated the scale unidimensionally in order to measure the general level of SNS addiction. The reliability of the full 18-item scale was high (Cronbach's $\alpha$ = .89).

of three subscales measuring the need for autonomy (e.g., "In my daily life, I feel free to be who I am"), competence (e.g., "In my daily life, I feel capable and effective"), and relatedness (e.g., "In my daily life, I feel loved and cared about"). Items were rated on a 5-point scale ranging from 1 "*strongly disagree*" to 5 "*strongly agree*". Internal consistencies for each dimension were satisfactory (autonomy: Cronbach's $\alpha$ = .70, competence: Cronbach's $\alpha$ = .79, relatedness: Cronbach's $\alpha$ = .69).

### 3.2.2. Intrinsic need satisfaction in daily life

We assessed individual differences in basic psychological need satisfaction using an adaption of the 12-item scale developed by La Guardia, Ryan, Couchman, and Deci (2000). The scale consisted

### 3.2.3. Motives of Facebook use

Based on prior research (Joinson, 2008; Papacharissi & Mendelsohn, 2011; Smock et al., 2011), we created a scale measuring seven motives for Facebook use: escapism (e.g., "I use Facebook

**Table 1**
Summary of the Facebook addiction scales and individual items.

| Items | α | M | SD |
|---|---|---|---|
| Loss of control | .83 | 2.20 | 0.94 |
| While surfing on Facebook, I often think "Just a few more minutes" and then I cannot stop anyway (*LC01*) | | 2.24 | 1.16 |
| I often spent more time on Facebook then I intended (*LC02*) | | 2.52 | 1.26 |
| I often tried to cut down my time on Facebook, but without success (*LC03*) | | 1.52 | 0.08 |
| I sometimes wonder how much time passes when I am using Facebook (*LC04*) | | 2.54 | 1.31 |
| Tolerance | .84 | 2.18 | 1.09 |
| By now, I am spending more time on Facebook then at the beginning (*TL01*) | | 2.55 | 1.42 |
| The amount of time that I spent on Facebook has continuously increased (*TL02*) | | 2.19 | 1.27 |
| My desire to spent time on Facebook has continuously increased (*TL03*) | | 1.79 | 1.03 |
| Withdrawal syndrome | .81 | 1.51 | 0.65 |
| If I am off Facebook for a longer period of time, I feel nervous (*WS01*) | | 1.45 | 0.76 |
| If I am off Facebook for a longer period of time (e.g., because of vacation), I feel anxious and want to know what happens on Facebook (*WS02*) | | 1.38 | 0.65 |
| My thoughts often rotate around Facebook, even when I am not online (*WS03*) | | 1.75 | 1.02 |
| When I am not online I often ask myself what happens on Facebook (*WS04*) | | 1.47 | 0.76 |
| Negative consequences for social relations | .68 | 1.15 | 0.34 |
| Since I am using Facebook I do less with my friends "offline" (*SR01*) | | 1.20 | 0.52 |
| People who are important to me tell me that I changed for worse since I am using Facebook (*SR02*) | | 1.12 | 0.44 |
| People who are important to me complain that I spent too much time on Facebook (*SR03*) | | 1.06 | 0.30 |
| Since I am using Facebook some friends have withdrawn from me (*SR04*) | | 1.27 | 1.57 |
| Negative Consequences for work and performance | .65 | 1.80 | 0.81 |
| I am regularly on Facebook while being at work/school/university (*WP01*) | | 2.42 | 1.39 |
| My concentration at work/school/university suffers because I am on Facebook (*WP02*) | | 1.57 | 0.93 |
| I often neglect duties because of Facebook (*WP03*) | | 1.40 | 0.74 |
| Facebook Addiction Scale | .89 | 1.74 | 0.57 |

*Note.* Measured with a 5-point Likert-type scale ranging from "Strongly Disagree" to "Strongly Agree".

to take my mind off things"), self-presentation (e.g., "I use Facebook to actively form the image that others perceive of myself"), entertainment (e.g., "I use Facebook because it's fun"), information seeking (e.g., "I use Facebook to know what people talk about"), socializing (e.g., "I use Facebook to stay in contact with friends"), and meeting new people (e.g., "I use Facebook to meet new people"). Items were rated on a 5-point Likert scale ranging from 1 "*strongly disagree*" to 5 "*strongly agree*". All subscales showed satisfactory internal consistencies (escapism: Cronbach's $\alpha$ = .87, self-presentation: Cronbach's $\alpha$ = .84, entertainment: Cronbach's $\alpha$ = .82, information seeking: Cronbach's $\alpha$ = .79, socializing: Cronbach's $\alpha$ = .69; the motive of meeting new people was assessed with a single-item measure).

### 3.3. Data analysis

All three hypotheses specify the relations between intrinsic life satisfaction, SNS specific motives, and SNS addiction. The hypothesized statistical relationships thus represent *parallel multiple mediations* (Hayes, 2012) as they are based on the assumption that one independent variable $X$ (i.e., the intrinsic need) affects a dependent variable $Y$ (i.e., SNS addiction) through two potential mediators $M1$ and $M2$ (i.e., motives for SNS use). Accordingly, the parallel mediator model contains two indirect effects and one total indirect effect. The first indirect effect addresses the influence of $X$ through $M1$ on $Y$, whereas the second indirect effect describes the effect of $X$ trough $M2$ on $Y$. The total indirect effect addresses influence of $X$ on $Y$ through both mediators ($M1$ and $M2$). Furthermore, there is also the direct effect of $X$ on $Y$. When combined, the direct and the total indirect effect of $X$ on $Y$ yield the total effect of $X$ on $Y$ (Hayes, 2012).

In order to test the hypotheses, we used the SPSS dialog PROCESS (Hayes, 2012). This macro-extension uses the analytical strategy suggested by Preacher and Hayes (2008). To test the significance of the hypotheses, 95% bias-corrected confidence intervals (CIs) for all effects were calculated through 5000 bootstrapped samples. The null hypothesis (that no indirect effect

exists) is rejected at the $\alpha$-level of significance if the confidence intervals do not include 0 (Preacher & Hayes, 2008, p. 191).

It is important to note that the results contain only unstandardized coefficients. When interpreting the indirect effects, it has to be taken into account that the size of the effects is subject to the scale values used to measure the variables. To overcome this shortcoming, effect size should be reported whenever possible. Yet, to our knowledge, there are no standardized effect sizes available for parallel multiple mediation models. However, as Preacher and Kelley (2011) denote, "it is often not appreciated that statistics in their original metrics can be considered effect sizes if they are directly interpretable" (p. 99). As all variables were measured using a 5-point Likert scale, we averaged every scale through the number of items, thus making the unstandardized path coefficients interpretable.

## 4. Results

### 4.1. Correlative analysis

In a first step, we computed zero-order correlations between all relevant variables (Table 2). The results show that the satisfaction of all three intrinsic needs in daily life is negatively associated with Facebook addiction. The strongest significant correlation was found between the perceived level of competence in daily life and Facebook addiction ($r = -.22$, $p < .001$). In contrast, all motives of Facebook use were strongly and positively related to Facebook addiction. High correlations where found between escapism and Facebook addiction ($r = .57$, $p < .001$) as well as between self-presentation and Facebook addiction ($r = .52$, $p < .001$). Both findings support our basic assumptions. As can be seen in Table 2, not all intrinsic needs are significantly correlated with all motives of Facebook use. Nonetheless, the relations postulated in H1 were supported as the perceived level of autonomy in daily life negatively correlated with the motives for escapism ($r = -.21$, $p < .001$) and self-presentation ($r = -.21$, $p < .001$). Additionally, a significant correlation with the motives for information seeking and meeting new

**Table 2**
Means, standard deviations and zero-order correlations.

| Variable | M (SD) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Facebook addiction | 1.74 (0.57) | 1.00 | | | | | | | | | |
| 2. Autonomy | 3.70 (0.65) | −.16[**] | 1.00 | | | | | | | | |
| 3. Competence | 3.95 (0.66) | −.22[**] | .57[**] | 1.00 | | | | | | | |
| 4. Relatedness | 3.97 (0.66) | −.12[**] | .47[**] | .60[**] | 1.00 | | | | | | |
| 5. Escapism | 2.77 (1.04) | .57[**] | −.21[**] | −.18[**] | −.12[**] | 1.00 | | | | | |
| 6. Self-Presentation | 2.13 (0.95) | .52[**] | −.21[**] | −.16[**] | −.21[**] | .44[**] | 1.00 | | | | |
| 7. Entertainment | 3.30 (1.00) | .46[**] | −.09[*] | −.05 | .04 | .65[**] | .48[**] | 1.00 | | | |
| 8. Information Seeking | 2.21 (0.88) | .49[**] | −.17[**] | −.10[*] | −.12[**] | .43[**] | .49[**] | .45[**] | 1.00 | | |
| 9. Socializing | 3.85 (0.81 | .40[**] | −.05 | .03 | .05 | .44[**] | .40[**] | .50[**] | .29[**] | 1.00 | |
| 10. Meeting New People | 1.76 (0.99) | .27[**] | −.15[**] | −.08 | −.14[**] | .26[**] | .35[**] | .26[**] | .37[**] | .16[**] | 1.00 |

[*] *p* < .05.
[**] *p* < .01.

people was also found. The perceived level of competence correlated negatively with the motives for information-seeking ($r = −.10$, $p = .013$) and self-presentation ($r = −.16$, $p < .001$) and thus supported the assumptions of H2. Furthermore, perceived competence was also negatively related to escapism. As predicted in H3, the perceived level of relatedness negatively correlated with self-presentation ($r = −.21$, $p < .001$) and with meeting new people ($r = −.14$, $p = .001$), supporting the assumed relations. Furthermore, perceived relatedness was also negatively related to escapism and information-seeking.

The zero-order correlations provide a first impression of the statistical relationships between all measured variables. In summary, the results were consistent with our assumptions.

### 4.2. Analyses of the parallel multiple mediations

We hypothesized (H1) that the perceived level of autonomy would be negatively associated with the motives for escapism and self-presentation, which, in turn, should positively influence Facebook addiction (cf. Table 3 for path coefficients). The total indirect effect of the perceived level of autonomy on Facebook addiction through the motives for escapism and self-presentation was $B = −0.14$. Using 5000 bootstrapped samples, the results indicate that the 95% bias-corrected confidence intervals (CI) did not contain 0 [−0.19, −0.09]. H1 was thus supported. The direct effect of autonomy on Facebook addiction was not significant ($B = −0.00$, $p = .914$). This pattern of results suggest a *perfect* or *complete* mediation, as the direct path between X (autonomy) and Y (Facebook addiction) is not significant after controlling for the mediator (Preacher & Kelley, 2011, p. 96). The path coefficients (see also Table 3) demonstrate that the indirect effect of perceived level of autonomy on Facebook addiction through escapism is slightly stronger than the indirect path through self-presentation.

The second Hypothesis (H2) postulated that the perceived level of competence is negatively related to the motives for self-presentation and information-seeking and that these motives positively influence Facebook addiction (cf. Table 4 for paths coefficients).

The total indirect effect of the perceived level of competence on Facebook addiction through the motives for self-presentation and information-seeking was $B = −0.07$. Again, the 95% bias-corrected CI for the indirect effect computed through 5000 bootstrapped samples did not contain 0 [−0.12, −0.03]. Accordingly, H2 was supported. This time, the direct effect of competence on Facebook addiction was significant ($B = −0.12$, $p < .001$), indicating that the model presents a *partial* mediation. As can be seen in Table 4, the direct effect is almost twice as strong as the total indirect effect through both mediators, suggesting that the indirect effects play a minor role in explaining the variance on the Facebook addiction scale.

In the third Hypothesis (H3), we assumed that the perceived level of relatedness is negatively correlated to the motives for self-presentation and for meeting new people (cf. Table 5 for paths coefficients). The total indirect effect of the perceived level of relatedness on Facebook addiction through the motives for self-presentation and meeting new people was $B = −0.10$, CI [−0.14, −0.06]. As in the first model, the direct path between competence and Facebook addiction was not significant ($B = −0.01$, $p = .866$) indicating a *perfect* mediation. H3 was hence supported as well. The path coefficients reveal that the indirect effect of the perceived level of relatedness on Facebook addiction through self-presentation is stronger than the indirect effect through meeting new people.

Comparing all three mediation models, it can be concluded that the second mediation model (competence on Facebook Addiction through self-presentation and information-seeking) explains 5.1% of the variance on the Facebook addiction, whereas the first model (autonomy on Facebook addiction through self-presentation and escapism) explained only 2.5%. The total effect of relatedness on Facebook addiction (third mediation model) through self-presentation and meeting new people accounted for 1.44% of the variance in Facebook addiction.

## 5. Discussion

The first goal of the present study was to develop a reliable and valid measure of SNS addiction. Although we limited the focus of

**Table 3**
Coefficients and effects for mediation model 1.

| | Coefficient B | SE | t | p | 95% Confidence interval |
|---|---|---|---|---|---|
| *Parallel multiple mediation model 1: perceived level of autonomy (H1)* | | | | | |
| Autonomy to mediator 1 (self-presentation) | −0.31 | 0.06 | −5.06 | .000 | [−0.42, −0.19] |
| Autonomy to mediator 2 (escapism) | −0.33 | 0.06 | −4.97 | .000 | [−0.46, −0.20] |
| Direct effect of mediator 1 on Facebook addiction | 0.20 | 0.02 | 9.03 | .000 | [0.15, 0.24] |
| Direct effect of mediator 2 on Facebook addiction | 0.23 | 0.02 | 11.46 | .000 | [0.19, 0.27] |
| Direct effect of autonomy on Facebook addiction | −0.00 | 0.03 | −0.11 | .914 | [−0.06, 0.05] |
| Indirect effect of autonomy on Facebook addiction through mediator 1 | −0.06 | 0.02 | | | [−0.09, −0.03] |
| Indirect effect of autonomy on Facebook addiction through mediator 2 | −0.08 | 0.02 | | | [−0.11, −0.05] |
| Total indirect effect of autonomy on Facebook addiction through both proposed mediator | −0.14 | 0.03 | | | [−0.19, −0.09] |
| Total effect of autonomy on Facebook addiction | −0.14 | 0.04 | −3.81 | .000 | [−0.21, −0.07] |

*Note.* Confidence intervals for indirect effects are bias-corrected, number of bootstrap samples: 5000.

**Table 4**
Coefficients and effects for mediation model 2.

| | Coefficient B | SE | t | p | 95% Confidence interval |
|---|---|---|---|---|---|
| *Parallel multiple mediation model 2: competence (H2)* | | | | | |
| Competence to mediator 1 (information seeking) | −0.14 | 0.06 | −2.48 | .013 | [−0.25, −0.03] |
| Competence to mediator 2 (self-presentation) | −0.23 | 0.06 | −3.75 | .000 | [−0.34, −0.11] |
| Direct effect of mediator 1 on Facebook addiction | 0.20 | 0.03 | 7.88 | .000 | [0.15, 0.25] |
| Direct effect of mediator 2 on Facebook addiction | 0.21 | 0.02 | 8.87 | .000 | [0.16, 0.25] |
| Direct effect of competence on Facebook addiction | −0.12 | 0.03 | −4.06 | .000 | [−0.18, −0.06] |
| Indirect effect of competence on Facebook addiction through mediator 1 | −0.03 | 0.01 | | | [−0.05, −0.01] |
| Indirect effect of competence on Facebook addiction through mediator 2 | −0.05 | 0.02 | | | [−0.08, −0.02] |
| Total indirect effect of competence on Facebook addiction through both proposed mediator | −0.07 | 0.02 | | | [−0.12, −0.03] |
| Total effect of competence on Facebook addiction | −0.19 | 0.04 | −5.47 | .000 | [−0.26, −0.12] |

*Note.* Confidence intervals for indirect effects are bias-corrected, number of bootstrap samples: 5000.

**Table 5**
Coefficients and effects for mediation model 3.

| | Coefficient B | SE | t | p | 95% Confidence interval |
|---|---|---|---|---|---|
| *Parallel multiple mediation model 3: relatedness (H3)* | | | | | |
| Relatedness to mediator 1 (self-presentation) | −0.30 | 0.06 | −5.11 | .000 | [−0.42, −0.19] |
| Relatedness to mediator 2 (meeting new people) | −0.21 | 0.06 | −3.30 | .001 | [−0.33, −0.08] |
| Direct effect of mediator 1 on Facebook addiction | 0.28 | 0.02 | 11.98 | .000 | [0.23, 0.32] |
| Direct effect of mediator 2 on Facebook addiction | 0.06 | 0.02 | 2.95 | .003 | [0.02, 0.11] |
| Direct effect of relatedness on Facebook addiction | −0.01 | 0.03 | −0.17 | .866 | [−0.07, 0.06] |
| Indirect effect of relatedness on Facebook addiction through mediator 1 | −0.08 | 0.02 | | | [−0.12, −0.05] |
| Indirect effect of relatedness on Facebook addiction through mediator 2 | −0.01 | 0.01 | | | [−0.03, −0.004] |
| Total indirect effect of relatedness on Facebook addiction through both proposed mediator | −0.10 | 0.02 | | | [−0.14, −0.06] |
| Total effect of relatedness on Facebook addiction | −0.10 | 0.04 | −2.88 | .004 | [−0.17, −0.03] |

*Note.* Confidence intervals for indirect effects are bias-corrected, number of bootstrap samples: 5000.

our study to Facebook, it is highly plausible that the scale can be used for any SNS. We conceptualized SNS addiction by focusing on five different symptoms of general addictive behavior: loss of control, tolerance, withdrawal syndrome, negative consequences for social relations and negative consequences for work and performance. We used the well validated Internet addiction scale (Hahn & Jerusalem, 2010) and modified the items to fit the context of SNS use. Confirmatory factor analysis provided evidence for the presumed second-order structure. The present study thus provides a new 18-item scale to measure the level of addictive behavior on SNSs (in this case Facebook addiction in specific). The present study did not examine cut-off scores for the classification of SNS addicts. However, in line with prior research (Andreassen et al., 2012; Hahn & Jerusalem, 2010; Lemmens, Valkenburg, & Peter, 2009) and taking into account the strong similarities between our SNS addiction scale and the original Internet addiction scale, we suggest applying a cut-off mean score of 3 or greater on all five dimensions to diagnose problematic SNS use. Following this definition, the prevalence of SNS addiction in the present sample was 2.6%. However, in order to establish an optimal cut-off point, the scale should be validated in clinical settings.

The second purpose of the present study was to examine the interplay of intrinsic need satisfaction in daily life and specific motives of SNS use in explaining SNS addiction. In line with prior research, the data showed that motives are a strong predictor of SNS addiction. Supporting the findings from Chen and Kim (2013), the results revealed that the motive for self-presentation in particular fosters addictive SNS use. Our results also replicate the finding of Kim and Haridakis (2009) and demonstrate that the motive for escape from daily life strongly predicts SNS addiction.

The data also provides evidence of the vital role of thwarted intrinsic needs for SNS addiction. The satisfaction of all three intrinsic needs addressed in the present study showed significant negative zero-order correlations with Facebook addiction,

suggesting that individuals who are confronted with thwarted needs in daily life have a particularly high risk of addictive Facebook use. As demonstrated in the mediation analysis, this influence of need satisfaction on Facebook addiction was at least partly mediated by the gratifications sought through Facebook use. This pattern of results indicates that users seem to try to compensate thwarted intrinsic needs through the use of SNSs because they expect corresponding gratifications through their Facebook use. This attempt to countervail deficits in intrinsic need satisfaction appears to be a driving force for excessive SNS use which, in turn, might become addictive.

Beyond demonstrating a *general* connection between thwarted intrinsic need satisfaction and motives for SNS use, the present study reveals systematic relationships between the need for autonomy, competence, and relatedness and *specific* patterns of gratification sought on Facebook. As predicted in H1, thwarted autonomy need satisfaction was associated with a stronger motive to use Facebook to present oneself freely and without external pressures and the motive to use SNSs to escape from daily life. It can thus be highlighted that people, who do not feel autonomous and free from constraints imposed on them by others, seek the opportunity to escape and distract themselves from this heteronomous offline environment through the use of SNSs. Furthermore, SNSs provide the possibility for self-determined self-presentation independent of social pressures. Our mediation analysis further demonstrated that the influence of autonomy on SNS addiction is indeed mediated by these specific motives, whereas the direct effect of thwarted autonomy need satisfaction on SNS addiction was not significant.

As predicted in H2, our data demonstrates that low competence need satisfaction was associated with a stronger motive for information-seeking and self-presentation, suggesting that users are trying to rebalance deficits in perceived competence by using SNSs. By searching for information on SNSs, individuals might feel more knowledgeable and more competent. At the same time, it seems

that SNSs provide their users with the opportunity to present themselves more effectively and more competently. Through "Likes" and comments on their profiles, users may get an impression of proficiency and capability. Again, this reinforcement of SNS use may slowly lead to a loss of control over the amount of use, foster a certain level of tolerance and consequently lead to addictive SNS usage. Yet, as our mediation analyses yielded only a partial mediation of the influence of competence need satisfaction though gratifications sought through SNS use, low levels of perceived competence also seem to foster SNS addiction directly.

Finally, as predicted in H3, thwarted relatedness need satisfaction was related to a stronger motive for self-presentation and for meeting new people. This finding suggests that individuals who feel lonely and consequently perceive a low level of relatedness in their daily lives might turn to SNS in order to present themselves more effectively to a broader audience and with the intention to meet new people. The strong potential of SNSs to provide users with the opportunity to meet new people and engage in social interaction as well as form social capital (Ellison et al., 2007) seems to be highly attractive for individuals with social deficits in the off-line context, resulting in an increased risk of addictive SNS use.

These findings paint a paradoxical picture of the risks and benefits of SNS use. On one hand, SNSs offer various opportunities to satisfy central human needs and enable its users to obtain valuable gratifications. This suggests that the use of SNSs may help to compensate for low levels of intrinsic life satisfaction in the offline domain and thus promote psychological well-being. On the other hand, however, seeking these very gratifications may reinforce excessive SNS use and ultimately increase the risk of developing a SNS addiction.

## 5.1. Limitations

A number of potential limitations have to be taken into account when interpreting the results. As the data stems from an online-survey which was distributed via email to a non-representative panel of Internet users, the results are not be representative for the general German population of Facebook users. However, the sample does resemble the demographic structure of German Facebook users as most users in the sample were between 18 and 34 years, which also constitute the largest group of users in the targeted population (allfacebook.de, 2013). However, females were slightly overrepresented in the sample. Furthermore, as the sample was recruited via e-mail invitations, the sample is self-selected and may over-represent users with a particularly high affinity for Facebook. However, we do not believe that the basic mechanisms of intrinsic need satisfaction addressed in the present study differs between our sample and the general population. Future research should nevertheless replicate and extend the findings of the present study based on more heterogeneous and representative samples of Internet users. Although the sample is likely to include people with a particularly strong interest in SNS use, their level of SNS addiction was low: Participants in the present study showed an average rating of $M = 1.74$ per item. This low average score indicates a general disagreement with the items of the scale. The small component of participants with addictive SNS use within the sample may place the generalizability of the results to a larger population of excessive SNS users into question (Kim & Haridakis, 2009).

A second limitation refers to the general problem of measuring psychological phenomena with standardized scales. It has to be acknowledged that addictive Internet use is a complex psychological disorder. A self-report instrument might oversimplify the actual phenomenon. As psychological disorders tend to be stigmatized, there is also the chance that many of the participants in this study did not judge their own behavior objectively due to low social desirability.

A third limitation is rooted in the cross-sectional design of the study. Cross-sectional research designs may suffer from the potential problem of confounded variables and cannot represent the temporal structure of the causes and effects under investigations. Causal assumptions and the direction of observed effects can hence only be tested in longitudinal designs. Besides the problem of causality, cross-sectional research designs also fail to provide information concerning the temporal stability of addictive behavior. It is hence not clear whether participants exhibit the same level of SNS addiction over longer periods of time. So far, however, only very few studies have examined the causes and effects of addictive behavior in online environments with longitudinal data (e.g., Van den Eijnden, Meerkerk, Vermulst, Spijkerman, & Engels, 2008). Future longitudinal investigations are thus essential for a more comprehensive perspective on SNS addiction.

## 5.2. Conclusion

Since the rise of the Internet and, even more so, since the advent of social media, researchers have investigated the negative effects of its use. Concerns about the risk of Internet addiction have featured particularly prominently among the negative effects addressed by research in the fields of media psychology and communication research. More recently, however, many researchers have argued that there is a need for more specific concepts of problematic online behavior, as Internet usage can be very diverse and covers a great variety of online applications (Griffiths, 1999). The present study thus specifically focused on addictive SNS usage, as the use of SNS in general and of Facebook in particular has reached considerable popularity and intensity over the last years.

The present study extends and adds to previous research in two central ways: first, the study provides a new and reliable scale for measuring SNS addiction and second, it integrates the interplay of thwarted need satisfaction and usage motives to explain SNS addiction. We believe that a theoretical perspective, which builds upon psychological theories such as self-determination theory in combination with theoretical approaches from communication science, such as the uses and gratifications perspective, contributes to the understanding of problematic user behavior in the social web. The present study thus provides a theory-based motivational approach that addresses the effects of the complex interaction of *offline* need satisfaction and the gratifications sought in the *online* context on addictive Facebook use. The findings suggest that individuals who experience low levels of intrinsic need satisfaction in their daily life may indeed find corresponding gratifications in using SNSs, and thus are particularly vulnerable to the risk of SNS addiction.

Overall, the present study paints a complex picture of the risks and benefits of SNS use. On one hand, SNSs represent a valuable refuge for many users which provides opportunities to escape from daily stress, demands, and frustrations. The SNS environment provides a plethora of potentially valuable gratifications that may contribute to psychological health and well-being. Paradoxically, however, the same gratifications that represent the central benefit of SNS use are also significant risk factors for the development of excessive and addictive SNS use. Providing a better understanding of these contradictory effects of SNS use in terms of psychological well-being and addictive behavior remains an important challenge for future research.

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