



# Modeling the contribution of personality, social identity and social norms to problematic Facebook use in adolescents



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## HIGHLIGHTS

- We investigated the role of personality and social influence processes in adolescent problematic Facebook use.
- Personality and norms were found to predict problematic Facebook use.
- Gender, group norms and social identity were found to predict frequency of Facebook use.

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## ABSTRACT

Facebook is the most popular social networking site in the world providing the opportunity to maintain and/or establish relationships, to share media contents and experiences with friends, and to easily communicate with them. Despite the resources and the innovative social features offered by Facebook research has emerged indicating that its use may become problematic, with negative consequences on personal psycho-social well-being, especially among adolescents and young adults. The main aim of this study was to examine the unique contribution of personality traits and social influence processes (i.e. subjective norms, group norms, and social identity) to perceived frequency of Facebook Use and Problematic Facebook Use in a sample of adolescents. A total of 968 Italian adolescents participated in the study. Structural equation modeling showed that emotional stability, extraversion, conscientiousness and norms directly predicted Problematic Facebook Use, whereas gender, group norms and social identity predicted perceived frequency of Facebook use. In conclusion, both personal and social variables appear to explain perceived frequency of Facebook use and Problematic Facebook Use among adolescents, and should be taken into account by researchers and educational practitioners.

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## 1. Introduction

Over the last decade Social Networking Sites (SNSs) use has become increasingly important in the way people interact with other people and social groups. Facebook, which holds about 1.5 billion active users, with at least 900 million of these logged into the site every day, is the most popular SNS in the world (Ryan, Chester, Reece, & Xenos, 2014). Facebook has many functions, including providing the opportunity to maintain and/or establish relationships, to share media contents and experiences with friends, and to easily communicate with them.

Despite the resources and the innovative social features offered by Facebook (Lee, Cheung, & Thadani, 2012), research indicates its use may become problematic, with negative consequences on personal psycho-social well-being, especially among adolescents and young adults

(Kuss & Griffiths, 2011). Problematic Facebook Use (henceforth PFU) has been found to be related to depression symptomology (Pantic, Damjanovic, Todorovic, et al., 2012), anxiety (Rosen, Whaling, Rab, Carrier, & Cheever, 2013), and decreased self-esteem (Satici & Uysal, 2015) leading to the suggestion that the use, over-use, or misuse of Facebook may manifest as a new potential mental health problem (Kuss & Griffiths, 2011). Moreover, Kuss and colleagues (2011) indicated that PFU appears to fall in the “cyber-relationship addiction” category proposed by Young (1999) to differentiate diverse types of Internet addiction/problematic Internet use. Even though the latter has not yet been recognized as a mental disorder in the fifth edition of DSM (for a review on this topic, see Kuss, Griffiths, Karila, & Billieux, 2014), and despite the fact that there is still a lack of consensus about terminology and definition of both Internet addiction and Facebook addiction (Moreau, Laconi, Delfour, & Chabrol, 2015), several researchers agree in highlighting that Internet use, and especially SNSs use, could be problematic for some users (Kuss & Griffiths, 2011; Satici & Uysal, 2015).

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For the purposes of this study, we adapted Caplan's (2010) measure of Generalized Problematic Internet Use to the Facebook context (Ryan et al., 2014). This measure has been recognized as a viable option for measuring PFU (Lee et al., 2012; Ryan et al., 2014) because it defines some features of problematic Internet use that apply readily also to PFU, including: (1) preference for online interactions; (2) motivation to use the Internet for mood regulation; (3) deficient self-regulation in terms of obsessive thought patterns involving Internet use (i.e. cognitive preoccupation) and compulsive negative use; and (4) negative consequences for daily social life that may occur.

Recent research has highlighted the possible contribution of personality and social influence processes to PFU (Kuss & Griffiths, 2011; Lee et al., 2012). However, to date, no study has investigated the relative contribution of these constructs in predicting PFU among adolescents. We focused on adolescence because it has been recently argued that Facebook is heavily used by adolescents to shape their relationships with peers and to outline personal characteristics, such as personality and identity, which develop in this particular period of life (Doornwaard, Moreno, van den Eijnden, Vanwesenbeeck, & ter Bogt, 2014).

### 1.1. Personality as a predictor of Facebook use

The Five-Factor Model (Caprara, Barbaranelli, Borgogni, & Perugini, 1993; Caprara, Barbaranelli, & Livi, 1994) traces individual personality differences based on five main dimensions: Extraversion (which refers to expansiveness and energy), Agreeableness (which refers to concern and politeness), Conscientiousness (which refers to orderliness and precision), Emotional Stability (which refers to the capacity to cope with anxiety and emotionality), and Openness (which refers to openness to novelty and interest toward different people and cultures). Previous studies have found personality characteristics to be linked to online experiences by influencing, for example, the frequency of Internet use and interpersonal communication (e.g., Butt & Phillips, 2008; Ross et al., 2009). Research has also shown that introverts can cope with their off-line social difficulties using online communications (Amichai-Hamburger, Wainapel, & Fox, 2002) and that extraversion is a significant predictor of frequent Internet use to engage in social activities. In addition, neuroticism has been observed to play a role in affecting the sharing of information in social networks (Ross et al., 2009). Moreover, openness to experience has been associated with a greater tendency to be sociable on Facebook, and agreeableness and conscientiousness appear to be linked to the number of friends on SNSs (Ross et al., 2009).

### 1.2. Application of the social influence theory to Facebook use

Social Influence Theory proposes that individual cognition and behavior can be affected by three social processes: compliance (normative influence of others' expectations), internalization (congruence of one's goals with those of other group members), and identification (i.e. conception of one's self in terms of the group's defining features) (Kelman, 1974). These processes may be operationalized as subjective norms, group norms, and social identity (see Aim of the current study section). Because SNSs are social in nature, Social Influence theory has been recently adopted by several researchers (e.g., Dholakia, Bagozzi, & Pearo, 2004; Zhou, 2011) to examine the role of social influence processes in predicting participation intention and, in turn, actual behavior in virtual communities. It has indeed been found that intention to participate in social network activities predicted actual online behaviors and higher levels of virtual community engagement (Zhou, 2011). For example, participation intention may be particularly influenced by subjective norms (i.e., compliance), in that, one should be more prone to participate in online activities if such activities are valued and expected by other in-group members. Similarly, a process of internalization of group norms (e.g., what significant others think about online activities or how they behave online) may influence an individual intention to

participate in the same online activities and subsequent consistent behavior. Therefore, because social influence processes tend to be particularly strong during adolescence (Brechwald & Prinstein, 2011; Prinstein & Dodge, 2008), adolescents' behaviors in online communities can be especially influenced by their peers' attitudes and beliefs about online activities and their actual behavior online; that is adolescents' decision to do something in online contexts can be regulated after significant references' pressure, expectations and behaviors (Doornwaard et al., 2014).

### 1.3. Aim of the current study

This study reports the derivation of a model designed to assess the contribution of personality, social identity and social norms to perceived frequency of Facebook use (henceforth PFFU) and PFU among adolescents. The model is presented on Fig. 1 and the following are hypotheses derived from the literature sustaining the module structure.

**H1: PFFU and PFU will be positively associated with openness and agreeableness and negatively associated with emotional stability, extraversion, and conscientiousness.**

**H2: PFFU and PFU will be positively associated with the endorsement of subjective norms around such usage.**

Subjective norms refer to what particular behavior is considered appropriate and, to some extent, prescribed within a group ("what ought to be"; e.g., Cialdini, Kallgren, & Reno, 1991). In other terms, they refer to the group "pressure" an individual feels about what he/she should do and his/her beliefs about what others expect him/her to do. Studies have shown that the norms such groups hold can influence both positive and negative attitudes and behavior, including during adolescence (e.g., Borsari & Carey, 2003; Pozzoli & Gini, 2013). In this context subjective norms refer to the influence of important others' mindsets on the need for Facebook use. Adolescents who endorse subjective norms that favour Facebook use, that is, who perceive that significant people think that they should use Facebook will be more likely to engage with it.

**H3: PFFU and PFU will be positively associated with the endorsement of group norms around such usage.**

While subjective norms refer to what group members expect other individuals in the group to do, group norms in general refer to the congruence of group's goal to one's goal (Zhou, 2011). In particular, in SNSs context they reflect, for example, the agreement among group members about the importance (for themselves) of using Facebook. Therefore, adolescents who endorse group norms favorable to the use of Facebook and share positive values about Facebook with their group (i.e., the process of internalizing group norms; Kelman, 1974) will be more likely to engage with it.

**H4: PFFU and PFU will be positively associated with the strength of social identity.**

Social identity reflects one's definition of self in relation to his/her group. It includes three dimensions: cognitive social identity (the overlapping of self-image with the identity of friends' group), affective social identity (the feeling of belongingness toward friends' group), and evaluative social identity (the perceived value as a member of the friends' group). Social identity has been found a key factor in on-going perceptions and behaviors in general (Tajfel, 2010), in addictive behaviors (e.g. Buckingham, Frings, & Albery, 2013; Frings & Albery, 2015; Dingle, Dingle, Cruwys, & Frings, 2015), and in the whole Social Cure School (e.g. Jetten, Haslam, & Alexander, 2012). Therefore, we propose that social identity should lead adolescents to use Facebook.

## 2. Method

### 2.1. Participants

A convenience sample of 968 adolescent students from two secondary schools in Italy voluntarily participated in the study. The participants

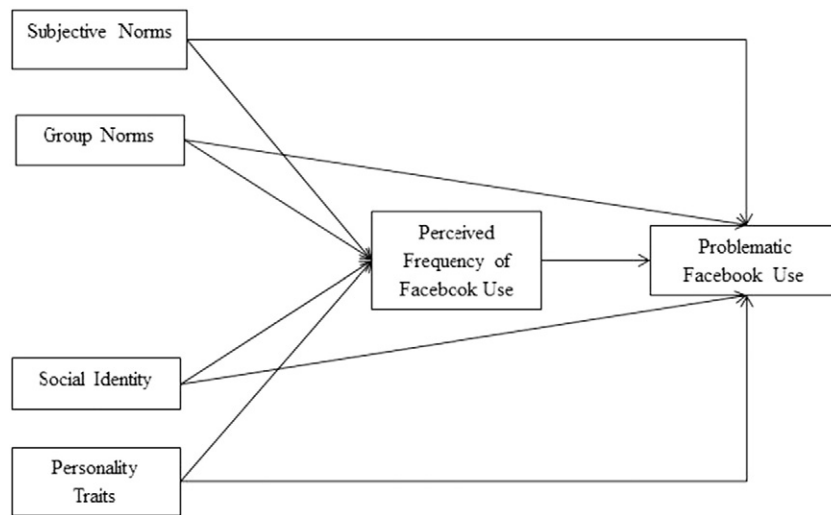


Fig. 1. Proposed theoretical model predicting problematic Facebook use in a sample of adolescents.

were 62.3% male and 37.7% female, ranging in age from 14 to 19 years (mean = 17.19, SD = 1.48).

## 2.2. Procedure

Permission was sought from the Head of School and signed consent was obtained from students' parents. Formal approval for this research was given by the Ethics Committee of Psychological Research at the University of Padova, Italy. All responses to the self-report instruments (outlined below) were collected during a regular school-day in classrooms and in the presence of the class teacher.

## 2.3. Self-report instruments

### 2.3.1. Problematic Facebook Use

PFU was measured with fifteen items adapted from the scale developed and validated by Caplan (2010). The items were rated on an eight-point scale (1 = "definitely disagree" to 8 = "definitely agree"). The scale included five subscales: preference for online interaction (e.g., "I prefer online social interaction over face-to-face communication"); mood regulation (e.g., "I have used Facebook to make myself feel better when I was down"); cognitive preoccupation (e.g., "I would feel lost if I was unable to access Facebook"); compulsive use (e.g., "I have difficulty controlling the amount of time I spend on Facebook"); and negative outcomes (e.g., "My Facebook use has created problems for me in my life"). Taken together, these factors give an overall index score for the construct of PFU. Higher scores on the scale indicate higher levels of PFU.

### 2.3.2. Perceived frequency of Facebook use (PFFU)

PFFU was measured using a 5-point scale (0 = "never" to 4 = "very often"), with participants rating how often they are online on Facebook in a day.

### 2.3.3. Personality traits

Personality traits were assessed using the Italian version of the Big Five Questionnaire (Caprara et al., 1993; Caprara et al., 1994) which covers five personality traits: agreeableness, conscientiousness, emotional stability, extraversion, and openness. The questionnaire contains 20 items rated on a 5-point scale (from 1 = "absolutely false for me" to 5 = "absolutely true for me"), so that higher scores indicate higher levels of on each trait.

### 2.3.4. Social influence processes

Three social influence processes were measured with items adapted to the Facebook context from a study of general online communities

(Dholakia et al., 2004). Subjective norms were measured with two items (e.g., "Most people that are important to me think that I should use Facebook") rated on a 7-point scale (1 = "definitely disagree" to 7 = "definitely agree"). Group norms were measured with two items (e.g., "How important is using Facebook for your friends?") rated on a 7-point scale (1 = "definitely disagree" to 7 = "definitely agree"). Social identity was assessed by two items for each dimension: cognitive social identity (e.g., "My image overlaps with the identity of my friends' group"), affective social identity (e.g., "How attached are you to your friends' group?"), and evaluative social identity (e.g., "I am a valuable member of my friends' group"). Items were rated on a 7-point scale (1 = not at all to 7 = very much).

## 2.4. Analyses

The pattern of relationships specified by our theoretical model (presented in Fig. 1) was examined through structural equation modeling (SEM) and a DWLS method was used to test the model, using the Lavaan package (Rosseel, 2012) of the software R (R Development Core Team, 2013). In the tested model, PFU was the dependent variable, personality traits and social influence processes were the independent variables, and PFFU was the mediator.

Before testing the model, two separate confirmatory factor analyses (CFA) were performed to examine the validity of the measure for the social identity and the validity of the measure for PFU. All other variables included in the model were predicted by the manifest items used to measure that construct.

## 3. Results

### 3.1. Correlations

Table 1 shows the Pearson Product-moment bivariate correlations among the variables of interest included in the model. PFU and PFFU were found to be positively correlated, in line with previous evidence (Kuss & Griffiths, 2011). As expected, all social influence processes positively correlated with PFFU and with PFU. Specifically, group norms correlated significantly with both PFFU and PFU, and subjective norms correlated significantly with PFU. All personality traits, except for conscientiousness, were significantly and negatively correlated with PFU such that decreased scores on emotional stability, extraversion, openness, and agreeableness, were associated with increased PFU. Moreover, weak correlations between three personality traits (emotional stability, extraversion, and agreeableness) and PFFU were found. Finally, gender positively correlated with PFFU but not with PFU.

**Table 1**  
Bivariate of the study variables.

	PFFU	PFU	SN	GN	SI	ES	E	C	A	O
Perceived Frequency of Facebook Use (PFFU)	1									
Problematic Facebook Use (PFU)	0.41**	1								
Subjective Norms (SN)	0.22**	0.41**	1							
Group Norms (GN)	0.61**	0.63**	0.58**	1						
Social Identity (SI)	0.11**	-0.09*	-0.02*	0.002	1					
Emotional Stability (ES)	-0.08*	-0.31**	-0.08*	-0.07	0.24**	1				
Extraversion (E)	0.07*	-0.29**	-0.03	0.05	0.40**	0.43**	1			
Conscientiousness (C)	0.05	0.01	-0.05	0.08*	0.01	0.20**	0.32**	1		
Agreeableness (A)	0.08*	-0.14**	-0.12**	-0.02	0.24**	0.21**	0.69**	0.32**	1	
Openness (O)	-0.05	-0.18**	-0.03	-0.07	-0.02	0.11*	0.44**	0.22**	0.62**	1
Gender (G)	0.29**	0.05	-0.07*	0.10*	0.001	-0.27**	0.10*	0.05	0.27**	0.21**

N = 968.  
\* p < 0.05.  
\*\* p < 0.001.

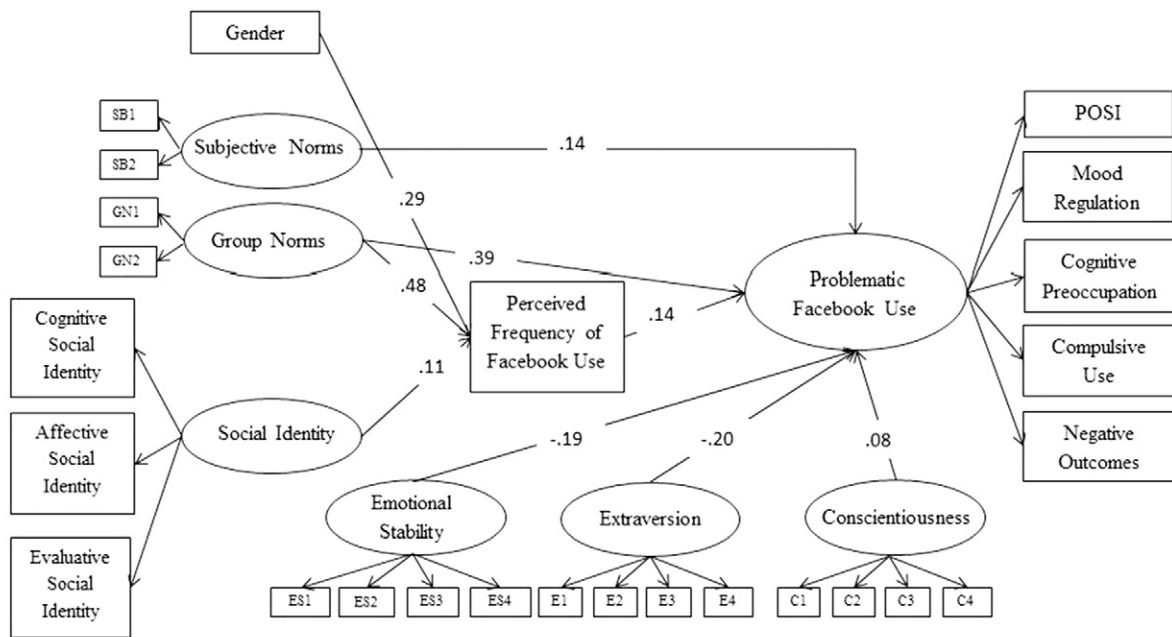
3.2. The CFA and SEM analyses

To evaluate the fit of a model, the following criteria are commonly considered: Comparative-Fit Index (CFI; good fit: > 0.95); Non-Normed Fit Index (NNFI; good fit: > 0.95); and Root Mean Square Error of Approximation (RMSEA; good fit: < 0.05) (e.g., Browne & Cudeck, 1993; Hu & Bentler, 1999).

Results of the CFA showed a more than adequate fit to the data for both the social identity model ( $\chi^2(6) = 3.772, p = 0.707, CFI = 1, NNFI = 1, RMSEA < 0.001$  [90% CI: 0.000, 0.031]) and the PFU model ( $\chi^2(80) = 191.771, p < 0.001, CFI = 0.99, NNFI = 0.99, RMSEA = 0.038$  [90% CI: 0.031, 0.045]). A first version of the model was tested including in the SEM all the variables of interest: latent independents made of observed scores for subjective norms, group norms, and personality traits. PFU and social identity also were latent variables identified by factor scores of the respective dimensions. Gender (dummy coded: M = 1, F = 2) was also included as a predictor in the model to control for the effect of gender on the associations among the measures. Results of the SEM for the whole model showed that it did not fit the data very well:  $\chi^2(482) = 2102.195, p < 0.001; CFI = 0.937, NNFI =$

0.927, RMSEA = 0.061 [90% CI: 0.058, 0.063], and ten standardized coefficients did not reach the statistical significance at 5% level: the effects of gender, social identity, openness, and agreeableness on PFU; the effects of subjective norms and five personality traits on the PFFU.

Therefore, we evaluated a second version of the model (Fig. 2), removing non-significant links (Lenzi et al., 2015; Pozzoli & Gini, 2013). The modified model fitted the data well,  $\chi^2(277) = 1054.605, p < 0.001; CFI = 0.960, NNFI = 0.953, RMSEA = 0.055$  [90% CI: 0.052, 0.059]. In this second model all estimated coefficients were statistically significant at the 5% level, with a satisfactory effect-size. Gender seemed to have an effect only on PFFU, showing that females tended to use the social network more frequently than males, but they were not more likely to problematically use Facebook. Regarding our main hypotheses on personality traits and Facebook use, partly consistent with H1, emotional stability ( $\beta_{STANDARDIZED} = -0.19$ ) and extraversion ( $\beta_{STANDARDIZED} = -0.20$ ) had only direct negative effects on PFU and a positive, though weak, direct effect was found between conscientiousness ( $\beta_{STANDARDIZED} = 0.08$ ) and PFU. Moreover, H2 was partially supported by the data because of the positive direct effect found between subjective norms and PFU ( $\beta_{STANDARDIZED} = 0.14$ ). H3 was fully supported by results: there was a positive direct link between group norms and



Note: All coefficients are significant at and below the 0.05 level.

Fig. 2. Tested model of the inter-relationships between the study variables. Note: All coefficients are significant at and below the 0.05 level.

PFU ( $\beta_{\text{STANDARDIZED}} = 0.39$ ) and an indirect effect of group norms and PFU (0.078) via PFFU. An indirect effect between social identity and PFU (0.015), via PFFU, was also observed partly supporting H4.

#### 4. Discussion

The goal of the present study was to examine the effect of both individual and social characteristics on PFFU and PFU among Italian adolescents. Overall, results indicate that personality traits and social influence processes are significantly involved in PFFU and/or PFU among adolescents.

With regard to the individual aspects, consistent with previous studies (Amichai-Hamburger & Vinitzky, 2010; Amichai-Hamburger et al., 2002; Kuss & Griffiths, 2011; Ryan & Xenos, 2011), three personality traits, extraversion, emotional stability (neuroticism), and conscientiousness, appear to have a significant role in influencing PFU among adolescents. Specifically, low rates of extraversion are associated to PFU. This result is supported by the social compensation explanation (Ong et al., 2010): the less extraverted adolescents may be more likely to use Facebook in order to compensate for their lack of interpersonal and social skills. They may tend to be worried about their self-presentation skills and to prefer online interactions, finding the social network a safer place to interact with others without the proximity and intimacy needed in real-life settings (Kuss & Griffiths, 2011). Moreover, the illusory benefit for introverts and shy people tending to feel more comfortable maintaining social relationships in online settings than in face-to-face situations (Ebeling-Witte, Frank, & Lester, 2007) may entail a higher amount of time spent online and engaging in PFU, in terms of negative consequences such as difficulties in their interpersonal life and missing social engagements (Caplan, 2010).

Furthermore, results show that those found to be low in emotional stability are more likely to use Facebook in a problematic way. It is possible that less emotionally stable adolescents tend to use Facebook to regulate their mood. Indeed, Amiel and Sargent (2004) found that people high in neuroticism (that is, low emotional stability) report using social networks to control information, to know what other users do, and to experience a sense of belonging to a group in order to satisfy their need for self-assurance (Amichai-Hamburger & Vinitzky, 2010). Finally, in line with previous research (Ross et al., 2009), conscientiousness does not appear to affect PFFU. A somewhat unexpected, though very weak, result from the SEM reveals that the degree of conscientiousness is related to PFU. A possible account for this result has been recently provided by Bachrach and colleagues (Bachrach, Kosinski, Graepel, Kohli, & Stillwell, 2012) who argue that the precision and organization of highly conscientious people may predispose them to focus on ordering pictures or events using the tools Facebook offers. Moreover, Amichai-Hamburger and colleagues (2010) explain that, specifically in the context of Facebook, highly conscientious people may strive for an ever-increasing number of friends. This tension may increase the need to have what is happening on Facebook under control and, so, to PFU. Understanding whether these mechanisms are actually in place in such circumstances may be a valid venue for future research.

As regard to social influence processes, results predominantly showed that they may have different effects on the way adolescents use Facebook. Firstly, subjective norms seem to affect the problematic (or not) nature of Facebook use rather than the perceived frequency of use. It can be argued that the more adolescents feel that people important to them think they have to use Facebook, the more they are likely to use it in a problematic way. In other words, PFU among adolescents is influenced by people who are important to them (de Oliveira, Zuniga Huertas, & Lin, 2016) and that pressure to use the social networks may be considered a risk factor for PFU regardless for the perceived frequency of use. In fact, despite the positive correlation between PFFU and PFU, the amount of time spent on the Internet does not necessarily indicate problematic use (Pontes, Kuss, & Griffiths, 2015).

Our findings suggest that adolescents who share values with their group about the importance of using Facebook (group norms) are more likely to both frequently use, and problematically engage, with Facebook. As suggested by de Oliveira et al. (2016), in a social network site like Facebook, users share thoughts and experiences with their friends. When they perceive that this group shares similar objectives, they may tend to frequently use Facebook in order to achieve the shared goal. Moreover, if adolescents share the belief that Facebook is equally important to them and to their group, they may use it problematically (Chan, Cheung, Lee, & Neben, 2015).

Finally, social identity seems to affect the PFFU but not PFU. Sharing ways of thinking, attachment to peer groups, and sense of belonging to peers in offline life do not directly determine PFU, but they may influence PFFU. Indeed, Lin, Fan, and Chau (2014) have recently reported that the sense of belonging to the group appears to positively influence the intention to continue using Facebook, for example to stay in touch with friends at any time. Since previous studies found opposing effects of the impact of social identity on Facebook use, future research are needed in order to understand this mechanism (Cheung, Chiu, & Lee, 2011; Hsu & Lin, 2008; Shen, Cheung, & Lee, 2013). In general, the model we tested demonstrated that the three social processes seem to play different roles in predicting the perceived frequency and quality of Facebook use.

In conclusion, since overuse and misuse of social networking sites may significantly affect young people's lives and well-being (Satici & Uysal, 2015; Bevan, Gomez, & Sparks, 2014), the results of this study may have some practical implications for educational programmes targeting adolescents. Prevention and intervention training may be delivered to young people in order to modify the way they perceive their social context, for example in terms of their peer groups, while also taking into account their individual characteristics.

The findings of this study must be considered with regard to two key limitations. First, a cross-sectional design was adopted and this may only be suggestive of a causal inference. Future research should thus seek to better understand the nature of the patterns observed through longitudinal studies. Second, all questionnaire-based studies are subject to recall bias and answer inaccuracy. Future studies could thus focus on gathering data, especially with respect to Facebook use, that are objectively linked to behavior. Third, the present study did not take into account the distinction between the different uses of Facebook (e.g., messaging friends, playing games like Farmville, gambling, video-games, friends monitoring, etc). According to Griffiths' (2012) argument, future studies should deepen the investigation of the different risk factors for PFU by testing whether such factors differentially contribute to the different activities. Despite its limitations, this preliminary study establishes important links between key personality traits and social variables in predicting the perceived frequency and maladaptation of Facebook use in adolescents.

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