Facebook addiction: Where does it come from? A study based on the Bergen Facebook Addiction Scale.

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Abstract

The present study investigates an innovative model of the phenomenon Facebook addiction, focused on (psychological) predictors like social anxiety, loneliness, depression, gender and Facebook usage types. This study, performed with an online survey among 315 respondents in the Netherlands showed that psychological variables have direct and indirect effects on Facebook addiction. Social loneliness is a strong predictor of Facebook addiction just as the construct of Facebook anxiety (the anxiety not getting on Facebook whenever a user wants) which leads to a higher Facebook addiction as well. For family loneliness and depression we found indirect negative effects, while social anxiety and gender resulted in positive direct effects. For romantic loneliness, there was no supporting evidence found. Where one would think that only active usage of Facebook leads to a higher addiction, passive use is a strong predictor as well; both types are creating problematic Facebook use. Finally, there is small evidence that women are more addicted towards Facebook then men. A remarkable conclusion is that women have a higher social anxiety and they are using Facebook more active; for them Facebook is a great alternative to get in contact with others.

Keywords: Facebook addiction, Facebook usage, loneliness, social anxiety, depression and gender.

1. Introduction

With 8.9 million users on Facebook in 2014, the number of users, yet again, has increased compared to 2013 in the Netherlands (Newcom Research & Consultancy, 2014). One of the most interesting findings of this trend report is the rise of the group 'daily users' from 5 million in 2013, to 6.1 million in 2014. In almost every measured age group (except 80 +) the daily use increased, which means that Facebook is still popular among different age groups. Because of the annual growth of daily users, the assumption can be made that Facebook addiction is becoming more concerning in the Netherlands.

The literature review from Kuss and Griffiths (2011) demonstrates that addiction to Facebook and SNS is measured in many ways, with several predictors and problematic outcomes like loneliness and Facebook usage. However, the evidence is not always convincing in Facebook studies, this also applies for depression and Facebook where there is a contradiction in literature. The final variable that is treated is a frequently used one in addiction studies, namely anxiety. From existing literature (Fallahi (2011; Lee & Stapinski, 2012; Rosen et al., 2013), it is known that there is a connection with addiction.

Because of the lack of evidence, the broader perspective of internet addiction is taking into account to gain more insights and evidence for behavioral addiction. Because of the similar symptoms of internet and Facebook addiction the two online platforms have an overlap (Kittinger et al., 2012), especially on a social level because of the communication possibilities within both platforms.

From an internet perspective Tao et al. (2010) state that internet addiction has become a major problem in Asia and therefore new diagnostic criteria are developed to identify clearly which individuals are addicted to internet. From the start of the internet, several consequences of internet addiction are classified by Young (1996) within five categories; academic, social, financial, occupational or physical in nature. The social category, also called relationship/interpersonal (Chou, 2011), is the most devastating consequence compared to the other categories (Douglas et al., 2008); therefore, the social perspective is chosen for this study. In addition, the more time people use the Internet, the more they lose contact with their social environment and become more addicted to the internet (Nie & Erbring, 2002; Kraut et al., 1998; Kelleci & Inal, 2010). This is in agreement with Kuss, Van Rooij, Shorter, Griffiths and Van de Mheen (2013), who found that the use of online social networking sites (SNS) increases the risk for internet addiction.

Besides of the previously mentioned variables of Facebook addiction on a social/psychological level there is a curiosity towards gender because of the conflicting studies (Widyanto & Griffiths, 2006; Kim et al., 2006; Turel & Serenko, 2012 ; Salehan & Negahban, 2013; Kittinger, Christopher, Correia & Irons, 2012), and for type of Facebook use divided in active and passive because, to our knowledge, there is a lack of evidence.

Finally, the main reason for choosing these variables is to find out more about Facebook addiction. To our knowledge, researchers state that it may be plausible to speak specifically of Facebook addiction, because the addiction criteria appear to be present in some people who use SNS's excessively (Kuss and Griffiths, 2011) and that the use of Facebook may contribute to the severity of symptoms associated with Internet addiction (Kittinger et al., 2012). In addition, Andreassen, Torsheim, Brunborg, and Pallesen (2012) performed a study with internet addiction criteria on a Facebook level, which is considered useful for this study to describe the phenomenon of Facebook addiction.

RQ: What are predictors that are causing Facebook Addiction?

2. Theoretical background

2.1 Internet, SNS and Facebook addiction

Internet addiction

Categorized as behavioral addiction internet addiction or problematic internet use (Lacovelli & Valenti, 2009) is defined as an individual's inability to control his or her Internet use. This addiction may lead to serious impairments in social functioning like excessive use, withdrawal, tolerance, negative social repercussions, conflict and modifying mood (Tao et al., 2010;Meerkerk, Van Den Eijnden, Vermulst & Garretsen, 2009;Park et al., 2012; Watters, Keefer, Kloosterman, Summerfeldt & Parker, 2013;Caplan, 2010).

In addition, psychological consequences of internet addiction are depression (Lacovelli & Valenti, 2009; Kim et al., 2006; Kraut et al., 1998), social anxiety (Fallahi, 2011; Lee & Stapinski, 2012), loneliness (Ang, Chong, Chye & Huan, 2012;Caplan, 2002) and shyness (Odaci & Çelik, 2013). Thus, from the internet addiction perspective many studies are performed in the last decade, which can be used for this study.

SNS addiction

To get a better understanding of SNS, the explanation of Kuss and Griffiths (2011) is applicable; SNS are virtual communities where users can create individual public profiles, interact with real-life friends, and meet other people based on shared interests on several means like desktops and mobile devices. Thus, the main difference between internet and SNS is the interaction principle with others, where internet use also consists of online communication (Lee & Stapinski, 2012), only to a smaller degree with less features. Therefore, it is an assumption that SNS are more susceptible for addiction behavior because of the constant interaction with others by several means.

From a SNS addiction point of view, the symptoms like conflict, withdrawal and behavioral salience are consistent with internet addiction (Ferraro, Caci, D'Amico & Di Blasi, 2007;Turel & Serenko, 2012), still it is not possible to suggest that users with internet addiction also have a SNS addiction, simply because SNS's are a specific part of the internet with special features. For SNS addiction there are also consequences involved namely, loneliness (Wan, 2009) less involvement in real-life communities, (Nyland, Marvez & Beck, 2007) worse academic performance (Kirschner & Karpinski, 2010) and relational problems (Muise, Christofides & Desmarais, 2009).

Facebook addiction

Within social networks, Facebook is not only the most common used network worldwide, but also the most popular one in the Netherlands (Newcom Research & Consultancy, 2014). From the 8.9 million users in total 6.1 million use the platform on a daily basis. Instantly, this is one of the arguments why researchers are so interested in the platform; everybody is using it and online behavior is changing quickly. The question, what distinguishes Facebook from other SNS is explained by the honeycomb of seven functional building blocks (Kietzmann, Hermkens, McCarthy & Silvestre, 2011). Here, the contrast between LinkedIn, Foursquare, Youtube and Facebook is presented. Instantly, the figure shows that Facebook has the most functionalities compared to the other three SNS. Two functionalities are small

within Facebook, back in 2011: 1) sharing and 2) groups. It is an assumption that these functionalities are enlarged in the last three years, what makes Facebook a complete SNS.

To explore whether Facebook users are addicted, a Facebook addiction scale was constructed by Andreassen et al. (2012). They distracted six constructs from existing literature (Wilson et al. 2010; Griffiths, 2005), namely: (1) salience, (2) mood modification (3) tolerance (4) withdrawal (5) conflict and (6) relapse. An approach that could be used for a categorization of problems with Facebook addiction is a score scheme which is frequently used in other behavioral studies. This may be done by the use of a polythetic scoring scheme (e.g., scoring 3 or above on at least four of the six items), or by the use of a monothetic scoring scheme (e.g., scoring 3 or above on all six items) (Andreassen, et al. 2012, p. 512). Although the constructs are similar to Internet and SNS addiction, it is not possible to say that users with SNS addiction have a Facebook addiction as well, mainly because of the completeness of Facebook, what is lacking within other SNS (Kietzmann, Hermkens, McCarthy & Silvestre, 2011).

In the research from Andreassen et al. (2012), women had higher scores than men on the BFAS, 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 (p.510). Moreover, Scheerman (2012) found that in particular lonesome, higher educated women are at greater risk of problematic Facebook use. In addition, the study of Kittinger et al. (2012) investigated the relationship between Facebook use and problematic Internet use among students. There was only a small difference between men and women. Nevertheless the score of women is, again, higher compared to men. Consistent with previous studies, a sizable minority of participants (approximately one in six) reported occasional or frequent problems in life because of their use of the Internet (p. 326). Kittinger et al. (2012) suggest that a combination of individual difference variables and extensive use of certain online applications like Facebook may be risk factors for problematic internet use (p. 327).

Furthermore, a study from Jelenchick, Eickhoff, and Moreno (2012) found no evidence supporting the relationship between Facebook use and depression among older adolescents with the same ethnicity. In addition to that, Grieve, Indian, Witteveen, Tolan, and Marrington (2013) revealed that Facebook connectedness has positive psychological outcomes in terms of depression and anxiety. This is confirmed by Rosen, Whaling, Rab, Carrier, and Cheever (2013), where participants who had more Facebook friends showed fewer clinical symptoms of depression. In the same study there are some contradictions; namely, that those who performed more Facebook impression management evidenced more clinical symptoms of major depression (p.1247). In conclusion of the prior study, higher scores on Facebook use and impression management predicted increased clinical symptoms like narcissism and antisocial.

Another study used personality traits and loneliness on Facebook use (Skues, Williams & Wise, 2012). They found that higher loneliness levels were associated with having more friends on Facebook. However, extraversion, neuroticism, self-esteem and narcissism were not found to be associated with Facebook use. For them, it was unexpected that self-esteem and narcissism were not significant to Facebook; the principle of loneliness was consistent with a prior study from Ellison, Stenfield and Lampe (2007). In addition, Facebook users have, on a significant level, higher levels of family loneliness than nonusers (Ryan & Xenos, 2011). Furthermore, the finding that lonely people tend to spend more time on Facebook per day, and have higher preferences for the passive features of Facebook, is particularly

concerning, according to the researchers (p. 1663). Within the principles of loneliness and anxiety, other types of Facebook usage are investigated (Clayton, Osborne, Miller & Oberle, 2013). Namely, (1) emotional connectedness to Facebook and (2) strategies for connecting with others on Facebook. Their results indicate that anxiousness significantly predict emotional connectedness to Facebook, and that loneliness and anxiousness significantly predict strategies for connecting with others on Facebook (p. 692). For the researchers it was interesting to see that loneliness did not predict emotional connectedness to Facebook.

2.2 Loneliness
People are social beings that have a desire for contact with others; when people become isolated in the real world, the need of contact remains and with the help of social network sites as Facebook it is easy to make contact to reduce loneliness on a social, family and/or romantic level. Ryan and Xenos (2011) state that lonely people spend more time on Facebook per day; what made this group more sensitive to Facebook addiction. This is confirmed by other studies like Wan (2009) where loneliness significantly and positively correlated with frequency and session length of using Xiaonei.com as well as SNS addiction, and Scheerman (2012) where there is correlation between more loneliness and problematic Facebook use.

From the other way around internet and Facebook use are predictors of social isolation; the more people spend their time using the internet and Facebook, the more they lose contact with their social environment (Nie & Erbring, 2002; Fallahi, 2011; Lou, Yan, Nickerson & McMorris, 2012). To continue, the principle of social isolation is combined with loneliness due the similarity; in the study from Ryan and Xenos (2011) passive engagement of Facebook is positively correlated with loneliness and social loneliness where active social contributions of Facebook are negatively correlated with loneliness and social loneliness. For clarification, the passive and active features were set by a factor analysis and the researchers tested three subfactors of loneliness (social, family and romantic). Other features like real time social interaction and news & information are correlated with family loneliness; the last type, romantic loneliness, is not significantly measured. Although the features are not problematic, there is an obvious connection between different types of loneliness and addiction, therefore it is an assumption that loneliness is a predictor of problematic Facebook use, regarding to addiction. In conclusion the following hypotheses are drafted:

Hypothesis 1a: Social loneliness is a positive contributor to Facebook Addiction
Hypothesis 1b: Family loneliness is a positive contributor to Facebook Addiction
Hypothesis 1c: Romantic loneliness is a positive contributor to Facebook Addiction

2.3 Depression
In existing literature, depression and addiction are well known concepts that are related to each other. For instance, Kraut et al. (1998) found that greater use of internet (communication purpose) was associated with increased levels of depression. More than a decade later internet use for non-communication purposes predicted more depression, where the communication purpose predicted less in an adolescent setting (Selfhout , Branje, Delsing, Ter Bogt & Meeus, 2009, p. 819). Furthermore,

depression is correlated with problematic internet use (Caplan, 2002; Kelleci & Inal, 2010; Lacovelli & Valenti, 2009). Here, Kelleci and Inal (2010) suggest that increasing use of internet associates with higher levels of depression where Lacovelli and Valenti indicate that excessive users were more likely to be depressed for communication purposes (p. 439). Finally, in a study where groups are divided in addicted and none addicted, the levels of depression were highest in the Internet-addicts group.

From a Facebook perspective Jelenchick, Eickhoff and Moreno (2012) tried to find a relationship; unfortunately they did not confirm the association between Facebook use and depression. It is worth mentioning to say that the sample was small in this particular study, namely older adolescents with the same ethnicity. Therefore conclusions are not applicable in general. Moreno et al. (2011) found display symptoms consistent with depression via status updates on Facebook, suggesting that depression stimulates users to speak out on Facebook, which may lead to Facebook addiction.

Still the contradiction is interesting for the present study. Together with the lack of evidence on a Facebook level, the following hypotheses are created:

Hypothesis 2: Depression is a positive contributor of Facebook Addiction
Hypothesis 3: Depression is a positive contributor of Active Facebook use

Furthermore, depression and loneliness are correlated in existing literature (Caplan, 2002; Weeks, Michela, Peplau & Bragg, 1980; Ouellet & Joshi, 1986; Cacioppo & Hawkley, 2009). Here Cacioppo and Hawkley (2009) state that loneliness is a risk factor for, and may contribute to depressive cognition. Again, it's an assumption that loneliness will be a predictor of depression. The more lonely people are, it becomes more difficult to work up the initiative to do things and lonely people have nothing (less) to look forward to. These two assumptions are factors of the depression variable, thus with logical reasoning the following three hypotheses are set up:

Hypothesis 4a: Social loneliness is a positive contributor to depression
Hypothesis 4b: Family loneliness is a positive contributor to depression
Hypothesis 4c: Romantic loneliness is a positive contributor to depression

2.4 *Social anxiety*
The final psychological variable that is measured in the present study is social anxiety; a type of anxiety related to a social network. Those with higher levels of anxiety are at an increased risk for developing an internet addiction (Kelley & Gruber, 2010, p.1844), problematic internet use (Lee & Stapinski, 2012) or Facebook addiction (Sheldon, 2008). Furthermore, internet use for non-communication purposes has been suggested to predict higher levels of social anxiety (Selfhout et al. 2009). We propose the following hypothesis:

Hypothesis 5: Social anxiety is a positive contributor of Facebook Addiction

Depression and anxiety show a significant correlation in the study of Grieve et al. (2013). This is in line with the study of Park et al. (2013) where depression and anxiety correlated within two scales; obviously there is a connection between the variables. In the study of Selfhout et al. (2009) depression and social anxiety are measured in two different time frames. In each regression analysis (3) social anxiety is a contributor of depression. Therefore the following hypothesis is drafted to confirm existing literature:

Hypothesis 6: Social anxiety is a positive contributor to depression

Despite of less empirical evidence, loneliness and anxiousness are significantly correlated in the study of Clayton et al. (2013). In the present study we assume that this connection will appear again, moreover it is possible that social anxiety will be a predictor of loneliness, due the fact that social anxiousness people have more problems to connect because of their shyness in multiple situations, what results in a higher loneliness.

Hypothesis 7a: Social anxiety is a positive contributor to social loneliness
Hypothesis 7b: Social anxiety is a positive contributor to family loneliness
Hypothesis 7c: Social anxiety is a positive contributor to romantic loneliness

2.5 Facebook anxiety
The principle of Facebook anxiety is derived from the research of Rosen et al. (2013), in this particular study the researchers tested technology related anxiety on four different technologies, including Facebook. For the current study, Facebook is appropriate, that is why technology related anxiety is called Facebook anxiety. To avoid ambiguities, Facebook anxiety is not about being scared to use the network, but the anxiety not getting on Facebook whenever you want and the anxiety to miss information when not online. This variable shows similarities with FOMO addiction (Fear of Missing Out) from Grohol (2011). Here, Facebook users have the fear of missing out on something or someone. They believe that what is happening on Facebook is more interesting then what is happening in offline settings; e.g. interrupting face-to-face conversations. Therefore it is a reasonable assumption that the desire to use Facebook, not to miss anything, will result in a higher Facebook addiction.

Hypothesis 8: Facebook anxiety is a positive contributor to Facebook Addiction

2.6 Active/Passive Facebook use
The last variable that is tested referring to Facebook addiction is type of Facebook use, separated into active and passive, by an identical factor analysis performed by Ryan and Xenos (2011). The difference between existing literature and the present study is the use of two factors instead of four and a more recent, specific list of Facebook features (19) because of the rapid changes of Facebook in recent years. Where Ryan and Xenos (2011) are interested in type of use personality characteristics like shyness, loneliness, narcissism and the Big five traits (extraversion, agreeableness, conscientiousness, neuroticism and openness) the present study focuses on type of use and addiction. Because it is unknown whether active or passive use results in more or less Facebook addiction, due the fact that to our knowledge, this is never measured before in combination with a factor analysis, it is an assumption that one of the two factors are predictors of Facebook addiction. Finally, with the assumption that Facebook anxiety is a

positive contributor to Facebook addiction, it is also interesting whether this anxiety results in more active and/or passive use of Facebook. Therefore we propose the following hypothesis:

Hypothesis 9a: Active use of Facebook is a positive contributor to Facebook Addiction
Hypothesis 9b: Passive use of Facebook is a positive contributor to Facebook Addiction
Hypothesis 10a: Facebook anxiety is a positive predictor of active use of Facebook
Hypothesis 10b: Facebook anxiety is a positive predictor of passive use of Facebook

2.7 Gender
Researchers state that women have a higher preference of social networking (Kuss & Griffiths, 2011; Salehan & Negahban, 2013) just as in the Dutch population, where 70% of the female internet users use Facebook, compared to 65% of male internet users (Van Deursen & Van Dijk, 2012). Going one step further in Facebook, the arguments above about women are confirmed: a higher percentage of women reported using more than once per day, and women reported spending significantly more time on Facebook than did men (Kittinger et al. 2012). Because Facebook is a social network and women are more socially oriented then men are (Lee, Chang, Lin, & Cheng, 2014) the suggestion is made that women are more likely to be addicted towards Facebook. To make it even more specific, lonesome, higher educated women are at greater risk of problematic Facebook use (Scheerman, 2012)
Looking at the gender perspective in combination with addiction, some researchers argue that males are at greater risk for internet addiction (Chou, Condron & Belland, 2005; Watters, et al., 2013; Ko, Yen, Chen, Chen & Yen, 2005; Ko, Yen, Yen, et al., 2005; Morahan-Martin & Schumacher, 2000; Widyanto & Griffiths, 2006), where others find no clear gender difference in internet addiction (Kim et al., 2006; Hawi, 2012; Jang, Hwang & Choi, 2008). For SNS addiction, Turel and Serenko (2012) did not find convincing results within the gender perspective. In conclusion, because of the social characteristic of Facebook and the additional preferences of women we hypothesize that:

Hypothesis 11: Women are more likely to be addicted to Facebook than men
Hypothesis 12a: Women are more likely to be more active Facebook users than men
Hypothesis 12b: Women are more likely to be more passive Facebook users than men
Hypothesis 13: Women are more likely to be more socially anxious than men

Besides of the foregoing hypotheses, there is also a curiosity towards other unknown connections after the model testing. If there are any relevant findings, e.g. passive use and social anxiety, these will be presented in the discussion section.
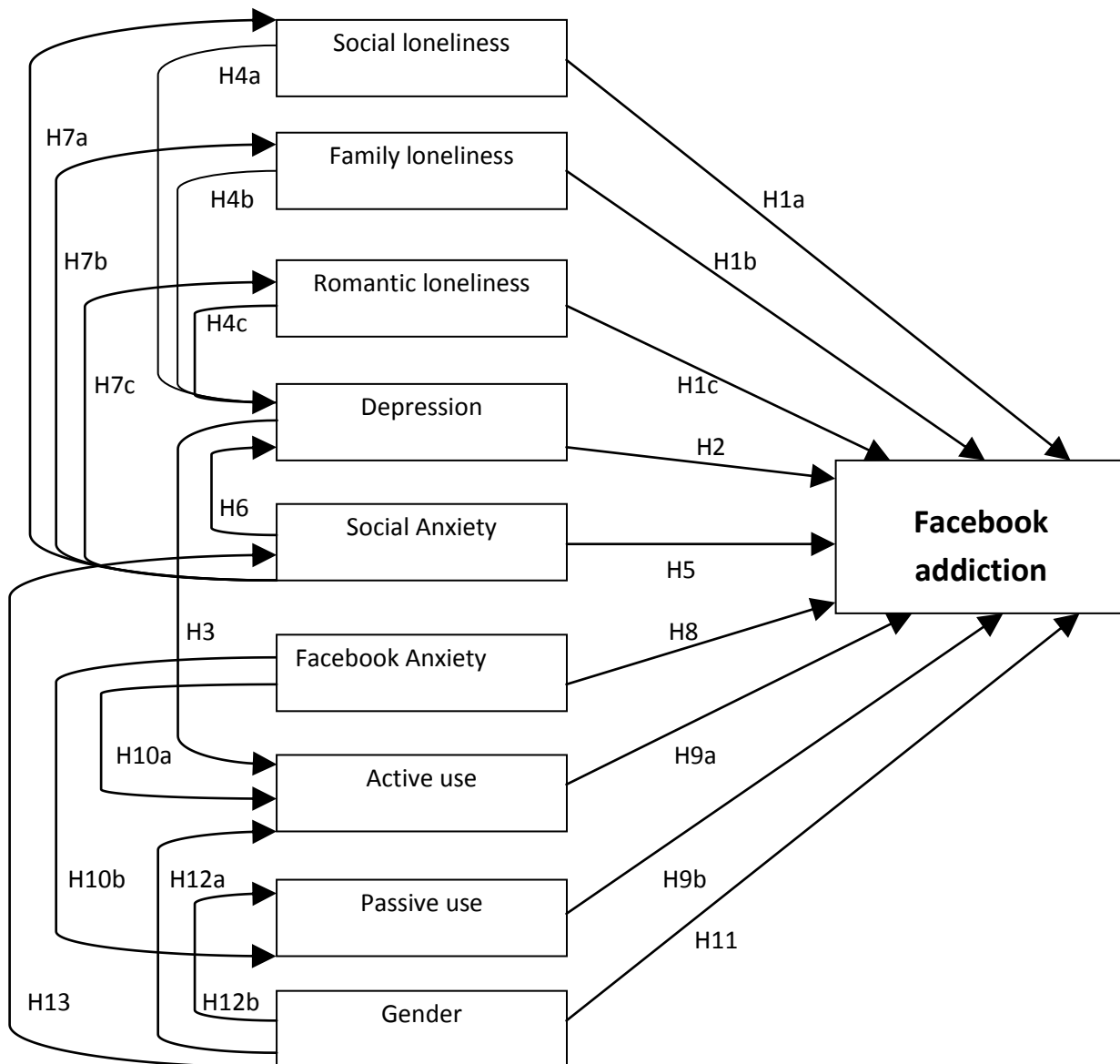
2.8 Conceptual Model

Figure 1. Conceptual model; presentation of the hypotheses

3. Method

3.1 Procedure

In order to perform a successful, valid and reliable research, a pre-test was developed. On the 19th of September the pre-test was rolled out via Qualtrics, an online survey tool. The pre-test was made by 37 respondents, in order to see whether the translated questions from existing literature were understandable and correctly interpreted, besides of the reliability in total. After an analysis by the statistical program of SPSS, some questions were adapted and/or added to reach a higher reliability on several constructs as depression and Facebook addiction.

3.2 Sample

The final data were collected by means of an online survey performed In the Netherlands from 26 September to 3 October 2014. To create a representative sample the online questionnaire was distributed within different groups from the researcher's network e.g. work, sports, university and business clubs etc. Through both offline and online word-of-mouth (sharing by Facebook and e-mail) the required number of respondents (>300) was achieved within a week. For reaching a higher survey response rate, it was communicated towards potential respondents that the online survey only took 5 to 10 minutes of their time. In total, 455 respondents started the online survey, of which 322 respondents completed the questionnaire. In addition, 7 incomplete surveys were removed, so 315 questionnaires were used for data analysis.

The following demographics were measured in the present study; gender, age (M=28.74, SD=10.20) and education. To gain more affinity with addiction absolute numbers for Facebook use in minutes per day on mobile devices (M=44.18), tablets (M=9.07) and desktops/laptops (M=16.59) are collected, as well as the number of years that respondents have a Facebook account (M=4.24).

Table 1. Demographic profile	N	%
Gender		
Male	178	56.5
Female	137	43.5
Age		
15-24	152	48.3
25-30	90	28.6
31+	73	23.1
Education		
Low	24	7.6
Medium	113	35.9
High	178	56.5

3.3 Measures

Facebook addiction was measured using the Bergen Facebook Addiction Scale (BFAS, Andreassen, Torsheim & Brunborg, 2012). The BFAS is an 18-item questionnaire with a 5-point scale ranging from very rarely to very often divided into 6 elements of addiction; (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 (Andreassen et al., 2012, p. 503).Initially the 6 core elements are presented with three items, however in the present study some items are added and pretested to gain a valid construct. To get a better understanding of each construct, sample items (in the same order as above) included; how often during the last year have you: 'thought about how you could free more time to spend on Facebook?', 'Spent more time on Facebook than initially intended?', 'Used Facebook in order to forget about personal problems?', 'Experienced that others have told you to reduce your use of Facebook but not listened to them?', 'Become irritable if you have been prohibited from using Facebook?' and 'Given less priority to hobbies, leisure activities, and exercise because of Facebook?'. The only difference in the present study is the time period, where Andreassen, Torsheim, and Brunborg (2012) used a year; the current study provided a smaller period of time with three months. In conclusion, Facebook addiction was measured with an average of 20 items (M=1.73, SD=0.79, α=.90).

Loneliness was measured by the Social and Emotional Loneliness Scale for Adults – Short version (SELSA-S; Ryan & Xenos, 2011). The SELSA-S composed out of 15 items in total, distinguishes three sub factors, namely social, family and romantic loneliness on a 7-point agreement scale. Where the original instrument used a total loneliness score, the present study only consists of the individual sub factors with a 5-point agreement scale. Sample items for social loneliness contains 'I feel part of a group of friends' and 'I don't have any friends who share my views, but I wish I did', for family loneliness 'I feel close to my family' and 'I feel alone when I am with my family' and for romantic loneliness the following items give a clear overview 'I wish I had more satisfying romantic relationships' and 'I have a romantic partner to whose happiness I contribute'. In summary, three times five items were averaged as a measure of each loneliness type; social loneliness (M=1.75, SD=0.74, α=.67), family loneliness (M=1.60, SD=0.80, α=.73) and romantic loneliness (M=2.20, SD=1.14, α=.80).

Depression was measured with the shortened version of the Depression Anxiety Stress Scales – 21 (DASS; Lovibond & Lovibond, 1995). Henry and Crawford, (2005) adapted the scale from present tense to past tense and used a different response scale. In the present research the response scale was, yet again, adapted to a 5-point agreement scale. Sample questions included 'I often feel downhearted and blue', 'I regularly feel like I have nothing to look forward to' and 'I have difficulty becoming enthusiastic about almost anything'. In conclusion, seven items were averaged as a measure of depression (M=1.72, SD=0.78, α=.85).

Social anxiety was measured using a combination of the social anxiety subscale of The Self-Consciousness Scale: A Revised Version for Use with General Populations (Scheier & Carver, 1975) on a 4-point scale ranged from a lot like me too not like me at all and a subscale of the revised version of the

Screen for Child Anxiety Related Emotional Disorders (SCARED; Selfhout, et al., 2009) ranging from almost never too often on a 3-point scale. For creating a valid construct of social anxiety, pretesting was necessary, which resulted in an acceptable Cronbach's Alpha using a 5-point agreement scale. Sample items included 'Large groups make me nervous', 'I get shy around people I do not know well' and 'It's hard for me to work when someone is watching me'. In summary, social anxiety was measured and averaged with 8 items in total (M=2.43, SD=1.08, α=.84).

Facebook anxiety was obtained from the research of Rosen et al. (2013) were a general technology question was asked, namely 'If you can't check in with the following technologies as often as you'd like, how anxious do you feel?' One of the technologies in the foregoing question was Facebook, so the present research used this item for creating a new construct, which is to our knowledge never measured before. Where Rosen et al. (2013) used a 4-point scale from not anxious at all to highly anxious; the present study used the known 5-point agreement scale on 3 items, including 'If you can't check in with Facebook as often as you'd like, how anxious do you feel?'. With three items, Facebook anxiety was measured (M=1.53, SD=0.77, α=.78).

Facebook usage types were originated from a factor analysis out of Facebook features (Ryan & Xenos, 2011). In this research, some features were outdated, therefore only the up-to-date features are copied in the present research supplemented with features from Rosen et al. (2013). With the question 'how often do you use the following features (19) on Facebook' and an associated 5-point scale ranging from very rare to very often, it was possible to create two clusters after a principal component analysis with varimax rotation, one related to active use and one to passive use of Facebook. Factor loadings were employed at 0.4 and above for each item (Field, 2000). A total of 9 items were preserved in a two factor solution, which explained 60.6% of the total variance. The two-factor solution is displayed in appendix. In conclusion active use was measured and averaged with 6 items (M=2.32, SD=0.91, α=.85), passive use was averaged with 3 items (M=3.40, SD=0.93, α=.72).

Gender was included as a dichotomous variable. *Age* was collected with a basic, simple question were *Education* consisted of 9 different categories varying from the lowest to the highest education level in the Netherlands.

3.4 Data analysis

To test the hypotheses shown in Figure 1, structural equation modeling using Amos 22.0 was used. Structural equation modeling is a methodology in statistics that approved a confirmatory (i.e., hypothesis-testing) approach to the analysis of a structural theory impact on certain phenomena (Byrne 2013). Typically, this theory represents causal processes that generate observations of multiple variables (Bentler, 1988). According to Byrne, the concept of structural equation modeling represents two important sections of the procedure: (1) the causal processes under examination are represented by a series of structural (i.e., regression) equations; and (2) the structural linkages can be modeled scenic to enable a more clearly conceptualization of the theory under examination.

The presented model can then be assayed statistically in a simultaneous analysis of the whole system of variables to establish the extent to which it is consistent with the data. When the goodness of fit is sufficient, the model argues for the plausibility of postulated relations among variables, while if it is not sufficient, the tenability of such relations is rejected (Byrne, 2001). To achieve an extensive model fit,

we included the proposed index by Hair (2006): the χ2 statistic, the ratio of χ2 to its degree of freedom (χ2/df), the standardized root mean residual (SRMR) (<.08), the Tucker-Lewis index (TLI) (>.90), and the root mean square error of approximation (RMSEA) (<.06). These fit indices are typically used to represent the three categories of model fit: absolute, parsimonious, and incremental.

4. Results

4.1 Structural and path model

Statistical analyses were conducted to explore basic assumptions of structural equation modeling. Normality, kurtosis, and skewness did not differ significantly from acceptable criteria, and there were no outliers, nor multicollinearity beyond what would be theoretically expected. Table 2 provides the correlations between the variables.

Table 2. Correlation matrix

	1	2	3	4	5	6	7	8	9	10
1. Facebook addiction	-	*.09*	*.01*	*.09*	*.10*	*.10*	.64	.36	.36	*.05*
2. Social loneliness	-	-	.30	.31	.41	.13	*.06*	*.02*	-.19	*-.09*
3. Family loneliness	-	-	-	.28	.32	*.09*	*.06*	*-.10*	-.18	-.12
4. Romantic loneliness	-	-	-	-	.28	.17	*.11*	.07	*.00*	-.14
5. Depression	-	-	-	-	-	.44	.12	-.14	*-.09*	.05
6. Social anxiety	-	-	-	-	-	-	.16	*-.10*	.14	.12
7. Facebook anxiety	-	-	-	-	-	-	-	.24	.29	*.06*
8. Active use	-	-	-	-	-	-	-	-	.21	.14
9. Passive use	-	-	-	-	-	-	-	-	-	.12
10. Gender	-	-	-	-	-	-	-	-	-	-

Note: Significant at p < .05; non-significant correlations are in italic.

Figure 2 provides the path models with coefficients and variances explained. The fit results obtained from testing the validity of a causal structure of the conceptual model in Fig. 1 are as follows: χ2(2)=20.82; χ2/df=1.89; SRMR=.056; RMSEA=.05 (90% confidence interval [CI]=.01, .09). A significant χ2 value indicates a lack of satisfactory model fit. For improvement, we deleted several non-significant paths to operational Facebook addiction, resulting in a model with good fit and a non-significant χ2 value: χ2(2)=23.17; χ2/df=1.45; SRMR=.04; TLI=.96; RMSEA=.04 (90% confidence interval [CI]=.00, .07). The model explained 0.8% of the variance in family loneliness; 1.4% in social anxiety; 1.7% in social loneliness; 2.5% in Facebook anxiety, 4.1% in romantic loneliness, 12.3% in active use, 17% In passive use, 35,2% in depression, and 48.6% in Facebook addiction.
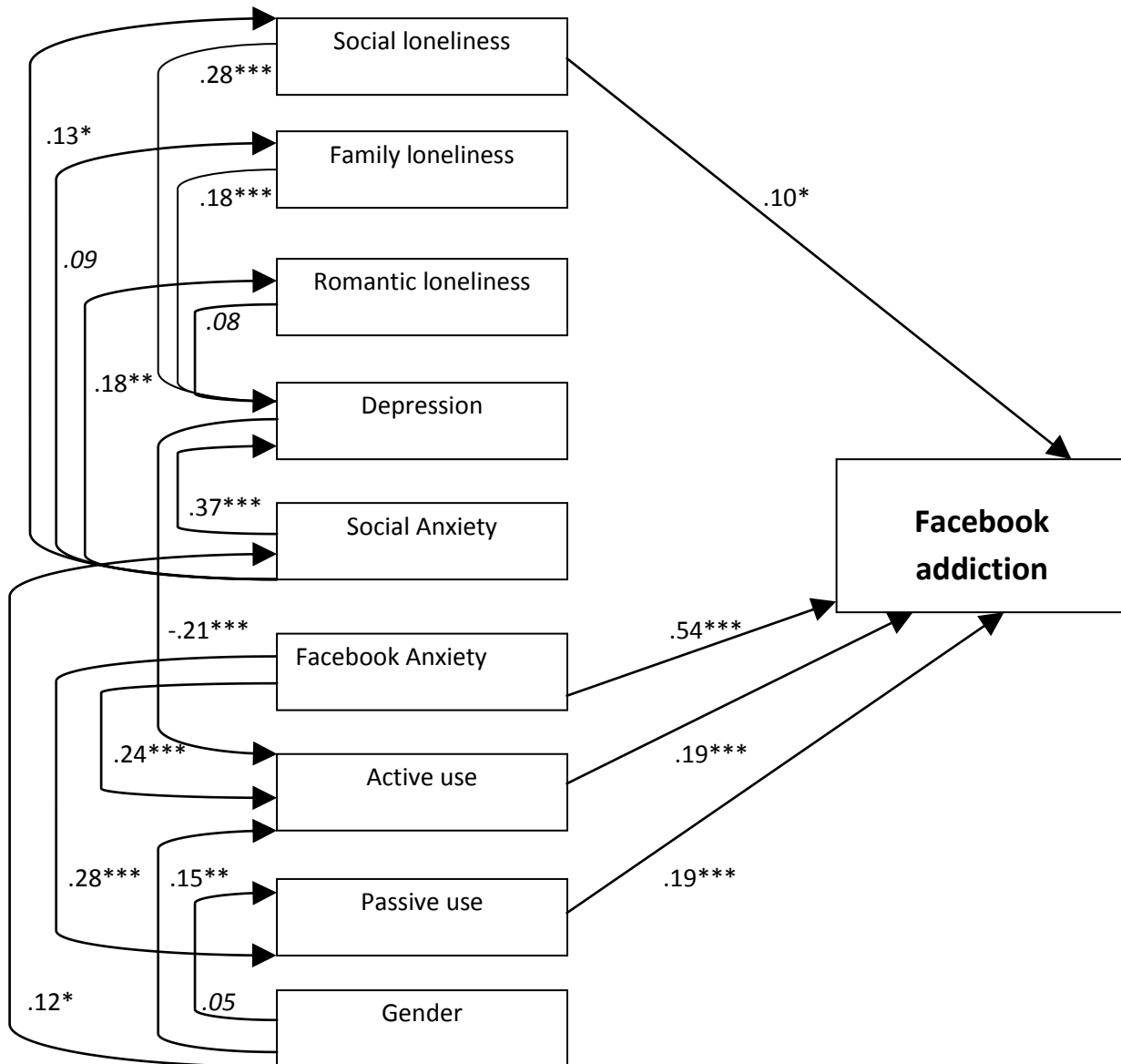
Figure 2. Standardized path coefficients
Note: *p<.05, **p<.01, ***p<.001.
Non-significant factor loadings in italics.

4.2 Overview of hypotheses

The standardized path coefficients in Figure 2 show several significant direct and indirect effects between Facebook addiction and the (psychological) variables. A coefficient linking one construct to another in the model represents the direct effect of a determinant on an endogenous variable. An indirect effect indicates a determinant's impact on a target variable through its effect on other intervening variables in the model. A total effect on a given variable is the sum of the respective direct and indirect effects. These effects are summarized in Table 3.

As presented in table 3, not all hypothesized relationships are confirmed; however in most cases indirect effects are found, for the hypotheses that are not supported. Only for H1c, H4c, and H7b statistical evidence is lacking. Furthermore table 3 reveals that social loneliness is a positive predictor of Facebook addiction, where there is a small negative indirect effect with family loneliness on Facebook addiction. Effects of depression and social anxiety on Facebook addiction are indirect. For the psychological variables several relationships are confirmed. For example a higher social anxiety that leads to a higher level of depression, a higher social anxiety that results in more loneliness on two levels (social and romantic) and more social/family loneliness leads to higher levels of depression. Depression contributes negatively to active use of Facebook, where active and passive use on the other hand contributes positively on Facebook addiction. Facebook anxiety directly effects Facebook addiction, active use and passive use; here it is worth mentioning that the effect of Facebook anxiety on Facebook addiction is very strong. Finally, gender contributes positively on active use and social anxiety, while there is a small indirect effect on passive use and Facebook addiction.

Table 3. Significant direct, indirect and, total effects Facebook Addiction

		Direct effects β	Indirect effects β	Total effects β
H1a.	Social loneliness-> Facebook addiction	.10	-.03	.07
H1b.	Family loneliness-> Facebook addiction	-	-.05	-.05
H1c.	Romantic loneliness-> Facebook addiction	-	-	-
H2.	Depression-> Facebook addiction	-	-.04	-.04
H3.	Depression-> Active use	-.21	-	-.21
H4a.	Social loneliness-> Depression	.28	-	.28
H4b.	Family loneliness-> Depression	.18	-	.18
H4c.	Romantic loneliness-> Depression	-	-	-
H5.	Social anxiety-> Facebook addiction	-	.12	.12
H6.	Social anxiety-> Depression	.37	.07	.44
H7a.	Social anxiety-> Social loneliness	.13	-	.13
H7b.	Social anxiety-> Family loneliness	-	-	.
H7c.	Social anxiety-> Romantic loneliness	.18	-	.18
H8.	Facebook anxiety-> Facebook addiction	.54	.10	.64
H9a.	Active use-> Facebook addiction	.19	-	.19
H9b.	Passive use-> Facebook addiction	.19	-	.19
H10a.	Facebook anxiety-> Active use	.24	-	.24
H10b.	Facebook anxiety-> Passive use	.28	-	.28

H11.	Gender-> Facebook addiction	-	.05	.05
H12a.	Gender-> Active use	.15	-.01	.13
H12b.	Gender-> Passive use	-	.02	.02
H13.	Gender-> Social anxiety	.12	-	.12

5. Discussion

5.1 Main findings

This study focused on predictors of Facebook addiction. Our conceptual model proposed four psychological (emotional) variables, Facebook usage types and a demographic variable. A striking finding is the unique construct of Facebook anxiety that is a strong predictor of Facebook addiction; the anxiety not getting on Facebook whenever a user wants leads to more problematic Facebook use. People, who don't want to miss anything on Facebook, log in more often. This is supported with the evidence that Facebook anxiety leads to more active and passive use of Facebook.

The loneliness principle in this study is a unique one that is, to our knowledge, never measured before in a behavioral addiction research. Because the completeness of Facebook it was an assumption that the three types of loneliness could be reduced by the use of Facebook resulting in addiction. The first main finding is that more social loneliness leads to a higher level of Facebook addiction, as suggested by Wan (2009) and Scheerman (2012). It is not surprising that people without or having few friends are using social network sites like Facebook to become part of a group, where his or her motives and reasoning are accepted. When isolation in the real world occurs, a simple and free solution is Facebook to get in touch with others who experiencing the same issues and or share the same thoughts to create so called 'weak ties' (Ellison et al., 2007). Once the need of social contact is satisfied it may be possible that users become addicted to the medium because the fulfillment of social contact is satisfying and can only be achieved online.

For romantic loneliness, the expectations were quite high, because the majority of people are active online, searching for a partner (Wu & Chiou, 2009). Perhaps, the network of Facebook is not applicable nowadays for searching new romantic relationship because there was no effect; it is an assumption that other networks, that focus specifically on relationships, are more popular and successful than Facebook for minimizing the romantic loneliness.

Family loneliness however, did have a small indirect effect on Facebook; more family loneliness leads to a lower level of Facebook addiction which was not in line with the expectation. Because there are no boundaries attached to Facebook, we thought that this type of loneliness was reduced by means of Facebook, which may lead to addiction. Here, it is possible that people with family loneliness have stronger social connections with friends, which is called bridging in literature (Ellison et al., 2007) in order to compensate their family loneliness. Nevertheless, the three unique types of loneliness ensures new insights in the research to SNS addiction, including Facebook addiction.

We found a negative effect from depression on Facebook addiction. Indirect depression leads to less active Facebook use and therefore a smaller level of Facebook addiction. An unexpected outcome because previous research shows that depression is a positive predictor of addiction (Kelleci & Inal, 2010; Lacovelli & Valenti, 2009). Nevertheless, people with a higher level of depression are not using Facebook, perhaps the positive stories, status updates and achievements of others are the main reason not to use the network because this may strengthens the level of depression for an individual.

The last psychological variable that is tested on Facebook addiction is social anxiety; this time a positive indirect effect occurs, suggesting that a higher social anxiety results in a higher Facebook addiction. Where people in real life have difficulties to be 'social', Facebook is a perfect network to show themselves in the best possible way, without the feeling that situations can become anxious. That is why the effect is logical, with reasonable thinking and with prior research (Sheldon, 2008).

We found a direct effect from both active and passive use of Facebook on Facebook addiction; thus there is no difference in type of usage and Facebook addiction. Where one would think that only active use results in more Facebook addiction because these users are constantly busy with posting and sharing of status updates, messages and photo's, passive use like reading, watching and searching for profiles, photo's and news feeds is also leading to more Facebook addiction. Suggesting that passive use of Facebook is becoming addictive because users are afraid to miss something or perhaps due loneliness. Active use leads to more addiction by the constant interaction with other users and because of the physical attractiveness of one's Facebook friends and social attractiveness (Walther et al. 2008).

For the gender perspective, the results show that the level of addiction is significantly higher for women. Hereby, current research about gender differences is extended with the outcome of the study. Prior research is contrary whether males or females are more addicted towards internet, where researchers in SNS and Facebook studies present that a higher percentage of women use Facebook more than once a day and spending more time on Facebook compared to men (Kittinger et al. 2012). This indicates that women have a higher preference of social networking because they are more socially oriented which make them more sensitive for addiction. Two other findings of gender are interesting as well; the effect of gender on social anxiety and active use of Facebook, where women are more active users of Facebook and have a higher level of social anxiety. Therefore, it is reasonable that with a higher level of social anxiety, women prefer a more active role instead of a passive role on Facebook or contact in real life.

As said before, there is also a curiosity towards additional effects that have occurred during the model testing. For instance the finding that family and social loneliness predict less passive use, suggesting that usage becomes more active to reduce the involved loneliness. Furthermore, social anxiety is a predictor of both Facebook anxiety as passive use of Facebook. For socially anxious people a social network is a solution to create and manage relations and friendships. For them it would be difficult to establish these relations without Facebook; that is the reason why they have a higher anxiety not getting on Facebook. However, the dependent of passive Facebook use makes it more complex. Where the expectation is that socially anxious people become more active on Facebook to communicate with others, the opposite occurs with more passive use of Facebook by socially anxious people.

For practice, it is quite concerning that people who become nervous and get worried to miss out everything without Facebook, are potentially more Facebook addicted. To prevent that the youngest generation becomes addicted, parents, schools and communities are important for pointing out the risks of social network sites which may change online behavior in the future. For individuals that are addicted it is important to provide instructions to addicting institutions what Facebook addiction is and where it is originated to understand and treat the problem.

5.2 Limitations

In the current study, we used a new designed model of loneliness, depression, social anxiety, Facebook usage, Facebook anxiety and gender to research Facebook addiction in the Netherlands. We found several interesting relations between the researched variables. However, the construct of the Bergen Facebook Addiction scale is to our knowledge only measured in the study from Andreassen, Torsheim & Brunborg (2012). Because it is an innovating, new scale with added variables from SNS addiction and Facebook addiction, and an own creation of Facebook usage by means of a factor analysis the reliability of the research is questionable. Therefore, future studies need to focus on the BFAS and the treated variables and additional variables among a representative group to achieve a higher reliability and generalizability. Moreover, an unexpected outcome in the Cronbach's Alpha of social loneliness (.67) creates a lower internal consistency then required. Where the pre-test achieved an acceptable alpha, the final survey unfortunately did not reach the requirement of .7.

The research group of the present study is a limitation. The study targeted for example on Facebook addiction and depression, where the average scores of the items on these constructs show that a minimal part of the respondents are actually Facebook addicted and/or depressed. This is a frequently occurred limitation in addiction research. For future research it is a recommendation to focus on Facebook addicts to find out if the observed variables change, this can be done by using score schemes which are frequently used in other behavioral studies. Further limitations are the psychological variables where it is always questionable if respondents answer the questions about depression and loneliness in an honest way. Nevertheless, the survey was anonymous and the respondents were informed that the results are for research purposes only. Therefore, the chances of a false completion are minimized.

Furthermore, the age group and educational level of the sample are not representative for the Dutch population because of the researchers' network; aside from the researchers' network it is also a challenge for future studies to achieve a representative sample, mainly because of the constant shift between age groups on SNS. E.g. the age of Facebook users is becoming older, where youngsters are seeking for new social networks like Instagram and Snapchat. The constant shift in SNS is explainable, because SNS are expanding and changing their functionalities for their (potential) users. Directly, this makes the operationalization of Facebook features in present studies challenging, looking at the factor analysis of the present study in active and passive use. So, Opportunities lie ahead for the possible generation difference in Facebook addiction and challenges for the operationalization of Facebook features.

For future research, the model can be used for multiple social network sites that are comparable with Facebook; only the factor analysis has to be analyzed separately, because other SNS like Foursquare and Youtube have specific features instead of all features. Because of this completeness of Facebook and the popularity, the platform is attractive for almost every age group. Whether you like to communicate directly with others, watch photos, place post or just watch what is happening on Facebook and that while it is free of charge. Although we can learn from internet and SNS addiction, Facebook is offering more possibilities than every other platform online, making it attractive for researchers.

For Facebook it is interesting whether older people are also becoming more addicted, with observations in public one would think that SNS are not only for the youngsters anymore and it is a suggestion that problems will occur for more groups. For this 'older' group there is a gap in existing literature (Kuss & Griffiths, 2011) so opportunities lie ahead. The concept of education is also interesting because, to our knowledge the level of education and Facebook addiction is never measured before, where this is measured several times for internet addiction in general. Mainly due the constant evolution of Facebook, research is necessary to get a better understanding of the phenomenon 'Facebook'.

REFERENCES

Andreassen, C.S., Torsheim, T., Brunborg, G.S., & Pallesen, S. (2012). Development of a Facebook Addiction Scale. *Psychological Report, 110* (2), 501-517.

Ang, R.P., Chong, W.H., Chye, S., & Huan, V.S. (2012). Loneliness and generalized problematic Internet use: Parents' perceived knowledge of adolescents' online activities as a moderator. *Computers in Human Behavior, 28 (4),* 1342-1347.

Byrne, B. M. (2013). Structural Equation Modeling With EQS: Basic Concepts, Applications, and Programming, Second Edition. Hoboken: Taylor and Francis.

Cacioppo, J.T., & Hawkley, L.C. (2009). Perceived social isolation and cognition. *Trends in Cognitive Sciences,* 13 (10), 447-454

Caplan, S.E. (2002). Problematic Internet use and psychosocial well-being: development of a theory-based cognitive–behavioral measurement instrument, *Computers in Human Behavior, 18,* 553-575.

Caplan, S.E. (2010). Theory and measurement of generalized problematic Internet use: A two-step Approach. *Computers in Human Behavior, 26,* 1089-1097.

Chou, C. (2001). Internet abuse and addiction among Taiwan college students: An online interview study. *CyberPsychology and Behavior, 4* (5), 573-585.

Chou, C., Condron, L., & Belland, J.C. (2005). A review of the research on internet addiction. *Educational Psychology Review, 17,* 363-388.

Clayton, R.B., Osborne, R.E., Miller, B.K. & Oberle, C.D. (2013). Loneliness, anxiousness, and substance use as predictors of Facebook use. *Computers in Human Behavior, 29,* 687-693.

Douglas, A.C., Mills, J.E., Niang, M., Stepchenkova, S., Byun, S., Ruffini, C., Lee, S.K., Loutfi, J., Lee, J.K., Atallah, M., & Blanton, M. (2008). Internet addiction: Meta-synthesis of qualitative research for the decade 1996–2006. Computers in Human Behavior, 24 (6), 3027-3044.

Ellison, N.B., Stenfield, C., & Lampe, C.(2007).The benefits of Facebook Friends Social capital and college students use of online social network sites. *Journal of Computer-Mediated Communication,*

Fallahi, V. (2011). Effects of ICT on the youth: A study about the relationship between internet usage and social isolation among Iranian students. *Procedia Social and Behavioral Sciences, 15,* 394-398. *12,* 143–1168.

Ferraro, G., Caci, B., D'Amico, A., & Di Blasi, M. (2007). Internet addiction disorder: an Italian study. *Cyberpsychology & Behavior, 10*(2), 170–175.

Grieve, R., Indian, M., Witteveen, K., Tolan, G.A., & Marrington J. (2013). Face-to-face or Facebook: Can social connectedness be derived online? *Computers in Human Behavior, 29,* 604-609.

Griffiths, M.D. (2005). A components model of addiction within a biopsychosocial framework. *Journal of Substance Use, 10,* 191-197.

Grohol, J. (2011). FOMO Addiction: The Fear of Missing Out. *Psych Central*. Retrieved on March 9, 2015, from http://psychcentral.com/blog/archives/2011/04/14/fomo-addiction-the-fear-of-missing-out/

Hair, J. F. (2006). Multivariate data analysis. Upper Saddle River, N.J: Pearson Prentice Hall.

Hawi, N.S. (2012) Internet addiction among adolescents in Lebanon. Computers in Human Behavior, 28 (3), 1044-1053.

Henry, J.D., & Crawford, J.R. (2005).The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a large non-clinical sample. British Journal of Clinical Psychology, 44, 227–239.

Jang, K.S., Hwang, S.Y., & Choi, J.Y. (2008). Internet addiction and psychiatric symptoms among Korean adolescents. *Journal of School Health, 78,* 165-171.

Jelenchick, L.A., Eickhoff, J.C., & Moreno, M.A. (2013). "Facebook Depression?" Social Networking Site Use and Depression in Older Adolescents*. Journal of Adolescent Health, 52*, 128-130.

Kelleci, M., & Inal, S. (2010). Psychiatric Symptoms in Adolescents with Internet Use: Comparison without Internet Use. *Cyberpsychology, Behavior and Social Networking, 13* (2), 191-194.

Kelley, K.J., & Gruber, E.M. (2010). Psychometric properties of the Problematic Internet Use Questionnaire. *Computers in Human Behavior, 26,* 1838-1845.

Kietzmann, J.H., Hermkens, K., McCarthy, I.P., & Silvestre, B.S. (2011). Social media? Get serious! Understanding the functional building blocks of social media. *Business Horizons, 54*, 241-251.

Kim, K., Ryub, E., Chon, M.Y., Yeun, E.J., Choi, S.Y., Seo, J.S., & Nam, B.W. (2006). Internet addiction in Korean adolescents and its relation to depression and suicidal ideation: A questionnaire survey. *International Journal of Nursing Studies, 43* (2), 185-192.

Kirschner, P.A., & Karpinski, A.C. (2010). Facebook and academic performance. *Computers in Human Behavior, 26*, 1237-1245.

Kittinger, R., Christopher, M.A., Correia, J., & Irons, J.G. (2012). Relationship Between Facebook Use and Problematic Internet Use Among College Students, *Cyberpsychology, Behavior and Social Networking, 15* (6), 324-327.

Ko, C. H., Yen, J.Y., Chen, C. C., Chen, S. H., & Yen, C. F. (2005). Gender differences and related factors affecting online gaming addiction among Taiwanese adolescents*. Journal of Nervous & Mental Disease, 193*, 273- 277

Ko, C.H., Yen, J.Y., Yen, C.F., Chen, C.C., Yen, C.N., & Chen, S.H. (2005). Screening for internet addiction: an empirical study on cut-off points for the Chen internet addiction scale. *Kaohsiung Journal of Medical Sciences, 21,* 544-551.

Kraut, R., Patterson, M., Lundmark, V., Kiesler, S., Mukopadhyay, T., & Scherlis, W. (1998). Internet Paradox: A social technology that reduces social involvement and psychological well-being? *American Psychologist , 53* (9), 1017-1031.

Kuss, D.J., & Griffiths, M.D. (2011). Online Social Networking and Addiction: A Review of the Psychological Literature. *International Journal of Environmental Research and Public Health, 8,* 3528-3552.

Kuss, D.J., Van Rooij, A.J., Shorter, G.W., Griffiths, M.D., & Van de Mheen, D. (2013). Internet addiction in adolescents: Prevalence and risk factors. *Computers in Human Behavior, 29* (5)*,* 1987-1996.

Lee, Y., Chang, C., Lin, Y., & Cheng, Z. (2014). The dark side of smartphone usage: Psychological traits, compulsive behavior and technostress. *Computers in Human Behavior, 31.* 373-383

Lee, B.W., & Stapinski, L.A. (2012). Seeking safety on the internet: Relationship between social anxiety and problematic internet use. *Journal of Anxiety Disorders, 26,* 197-205.

Lacovelli, A., & Valenti, S. (2009). Internet addiction's effect on likeability and rapport. *Computers in Human Behavior, 25,* 439-443.

Lou, L. L., Yan, Z., Nickerson, A., & McMorris, R. (2012). An examination of the reciprocal relationship of loneliness and Facebook use among first-year college students. *Journal of Educational Computing Research, 46 (*1*),* 105–117.

Meerkerk, G.J., Van Den Eijnden, R.J.J.M., Vermulst A.A., & Garretsen, H.F.L. (2009). The Compulsive Internet Use Scale (CIUS): Some Psychometric Properties. CyberPsychology & Behavior, 12 (1), 1-6.

Morahan-Martin, J., Schumacher, P. (2000). Incidence and correlates of pathological internet use among college students. *Computers in Human Behavior, 16,* 13-29.

Moreno, M.A., Jelenchick, L.A., Egan, K.G., Cox, E.Y., Henry, G., Kerry, E., & Becker, T. (2011). Feeling bad on Facebook: depression disclosures by college students on a social networking site. *Depression and Anxiety, 28* (6), 447-455

Muise, A., Christofides, E., & Desmarais, S. (2009). More information than you ever wanted: Does facebook bring out the green-eyed monster of jealousy? *CyberPsychology and Behavior, 12*, 441-444.

Nie, N.H., & Erbring, L. (2002). Internet and society: A preliminary report. *IT and Society, 1* (1), 275-283.

Nyland, R., Marvez, R., & Beck, J. (2007). MySpace: Social networking or social isolation? In Proceedings of the Midwinter Conference of the Association for Education in Journalism and MassCommunication, 23–24.

Odaci, H., & Çelik, Ç.B. (2013). Who are problematic internet users? An investigation of the correlations between problematic internet use and shyness, loneliness, narcissism, aggression and self-perception. *Computers in Human Behavior, 29,* 2383-2387.

Oullet, R., & Joshi, P. (1986) Loneliness in relation to depression and self-esteem. *Psychological Reports, 58,* 821-822.

Park, S.M., Park, Y.A., Lee, H.W., Jung, H.Y., Lee, J.Y., & Choi, J.S. (2013). The effects of behavioral inhibition/approach system as predictors of Internet addiction in adolescents. *Personality and Individual Differences, 54,* 7-11.

Rosen, L.D., Whaling, K., Rab, S., Carrier, L.M., & Cheever, N.A. (2013). Is Facebook creating ''iDisorders''? The link between clinical symptoms of psychiatric disorders and technology use, attitudes and anxiety. *Computers in Human Behavior, 29,* 1243-1254.

Ryan, T., & Xenos, S. (2011). Who uses Facebook? An investigation into the relationship between the Big Five, shyness, narcissism, loneliness, and Facebook usage. Computers in Human Behavior, 27, 1658-1664.

Salehan, M., & Negahban, A. (2013). Social networking on smartphones: When mobile phones become addictive. *Computers in Human Behavior, 29* (6), 2632-2639.

Scheerman, N. A. C. (2012). *Psychosociaal welzijn in relatie tot veelvuldig en problematisch gebruik van Facebook.* Retrieved from Universiteit van Amsterdam website: http://dare.uva.nl/document/ 357565

Scheier, M.F., & Carver, C.S. (1985). The Self-Consciousness scale: A Revised Version for Use with General Populations. *Journal of Applied Social Psychology, 15* (8), 687-699

Selfhout , M.H.W., Branje, S.J.T., Delsing, M., Ter Bogt, T.F.M., & Meeus, W.H.J. (2009). Different types of Internet use, depression, and social anxiety: The role of perceived friendship quality. *Journal of Adolescence, 32,* 819-833.

Sheldon, P. (2008). The relationship between unwillingness-to-communicate and students' Facebook use. *Journal of Media Psychology, 20,* 67–75.

Skues, J.L., Williams, B., & Wise, L. (2012). The effects of personality traits, self-esteem, loneliness, and narcissism on Facebook use among university students. *Computers in Human Behavior, 28,* 2414-2419.

Tao, R., Huang, X., Wang, J., Zhang, H., Zhang, Y., & Li, M. (2010). Proposed diagnostic criteria for internet addiction. *Addiction, 105* (3), 556-564.

Turel, O. & Serenko, A. (2012).The benefits and dangers of enjoyment with social networking websites. *European Journal of Information Systems, 21,* 512-528.

Van Der Veer, N. *(2014). Social Media Jongeren Onderzoek 2014* (1). Retrieved from Newcom Research & Consultancy website: http://www.newcom.nl/social-media-jongeren-onderzoek2014

Van Deursen, A.J.A.M. & Van Dijk, J.A.G.M. (2012). Trendrapport internetgebruik 2012. Een Nederlands en Europees perspectief. Enschede: Universiteit Twente.

Walther, J. B., Van Der Heide, B., Kim, S., Westerman, D., & Tong, S. T. (2008). The role of friends' appearance and behavior on evaluations of individuals on Facebook: Are we known by the company we keep? *Human Communication Research , 34*, 28-49.

Wan, C. (2009). Gratifications & loneliness as predictors of campus-SNS websites addiction & usage pattern among Chinese college students. M.S. Thesis, Chinese University of Hong Kong: Hong Kong, China,

Watters, C.A., Keefer, K.V., Kloosterman, P.H., Summerfeldt, L.J., & Parker, J.D.A. (2013). Examining the structure of the Internet Addiction Test in adolescents: A bifactor approach. *Computers in Human Behavior, 29* (6), 2294-2302.

Weeks, D.G., Michela, J.L., Peplau, L.A., & Bragg, M.E. Relation between loneliness and depression: A structural equation analysis. *Journal of Personality and Social Psychology, 39*(6), 1238-1244.

Widyanto, L., & Griffiths, M. (2006). Internet addiction: a critical review. *International Journal of Mental Health and Addiction, 4,* 31-51.

Wilson, K., Fornasier, S., & White, K.M. (2010). Psychological Predictors of Young Adults' Use of Social Networking Sites. *Cyberpsychology, Behavior and Social Networking, 13* (2), 173-177.

Wu, P., & Chiou, W. (2009). More Options Lead to More Searching and Worse Choices in Finding Partners for Romantic Relationships Online: An Experimental Study. CyberPsychology & Behavior, 12(3), 315-318.

Young, K. (1996). Internet addiction: The emergence of a new clinical disorder. University of Pittsburgh at Bradford. In: *Paper presented at the 104th annual meeting of the American Psychological Association, August 15, Toronto, Canada.*

Appendix A: Questionairre

Maak je gebruik van Facebook
1. Ja 2. Nee, bedankt voor uw deelneming.

 Ben je een man of een vrouw?
1. Man 2. Vrouw

Wat is je leeftijd?
....

Wat is je hoogst behaalde opleiding?
1. Geen opleiding
2. Lagere school/basisonderwijs
3. LBO/VBO/LTS/LHNO/VMBO
4. MAVO/VMBO-t/MBO-kort
5. MBO/MTS/MEAO
6. HAVO/VWO/Gymnasium
7. HBO/HEAO/PABO/HTS
8. Universiteit
9. Anders, namelijk....

Social anxiety
In hoeverre ben je het oneens/eens met de volgende uitspraak over jezelf in de afgelopen 3 maanden?
1. Ik vind het niet fijn om mensen om mij heen te hebben die ik niet ken.
2. Ik word nerveus als ik mij onder mensen bevind die ik niet goed ken.
3. Ik vind het moeilijk om met mensen te praten die ik niet ken.
4. Ik word verlegen bij mensen die ik niet goed ken.
5. Ik heb wat tijd nodig om over mijn verlegenheid heen te komen in nieuwe situaties.
6. Ik vind het lastig om te werken wanneer er iemand naar mij kijkt.
7. Ik voel me nerveus als ik voor een groep moet praten.
8. Grote groepen maken me nerveus.

Loneliness scale
In hoeverre ben je het oneens/eens met de uitspraak over jezelf in de afgelopen 3 maanden?
Social subscale
2. Ik maak deel uit van een groep vrienden. *
5. Mijn vrienden begrijpen mijn drijfveren en gedachtengang. *
7. Ik heb geen vrienden die mijn meningen delen, hoewel ik dit graag wil
9. Ik ben in staat vrienden om hulp te vragen. *
13. Ik heb geen vrienden die mij begrijpen, hoewel ik dit graag wil

Emotional Loneliness subscales
Family Subscale

1. Ik voel me alleen als ik met mijn familie ben.

4. Er is niemand in mijn familie op wie ik kan rekenen voor ondersteuning en aanmoediging, terwijl ik dit graag zou willen.

 8. Ik heb een sterke band met mijn familie. *

11. Ik voel me verbonden met mijn familie. *

12. Mijn familie geeft echt om me. *

Romantic subscale

3. Ik heb een (liefdes)relatie met iemand met wie ik mijn diepste gedachtes en gevoelens deel.*

6. Ik heb een (liefdes)relatie met iemand die me de steun en aanmoediging geeft die ik nodig heb. *

10. Ik zou graag meer voldoening willen halen uit mijn (liefdes)relaties.

14. Ik draag bij aan het geluk van mijn partner. *

15. Ik heb ontzettend/grote behoefte aan een (liefdes)relatie.

* Reverse items

Depression

In hoeverre ben je het oneens/eens met de volgende uitspraak over jezelf in de afgelopen 3 maanden?

1. Ik voel me vaak moedeloos en somber.

2. Ik heb regelmatig het gevoel dat ik niets heb om naar uit te kijken.

3. Ik heb vaak het gevoel dat het leven betekenisloos is.

4. Ik heb vaak het gevoel dat ik niet veel waard ben.

5. Ik heb moeite om ook maar over iets enthousiast te worden.

6. Ik ervaar geen positieve gevoelens .

7. Ik vind het lastig tot initiatief te komen om dingen te doen.

Bergen Facebook Addiction Scale

Hoe vaak gedurende de afgelopen drie maanden heb/ben je

Salience

BFAS1. Over Facebook nagedacht?

BFAS1A. De intentie gehad om Facebook te gebruiken?

BFAS 13. Nagedacht over wat er de afgelopen tijd op Facebook gaande was?

BFAS 7. Nagedacht over het beter inplannen van je tijd om Facebook te kunnen gebruiken?

Tolerance

BFAS 2. Meer tijd op Facebook doorgebracht dan je eigenlijk wilde?

BFAS 8. Een drang gevoeld om Facebook vaker te gebruiken?

BFAS 14. Het gevoel gehad dat je Facebook steeds vaker moet gebruiken om hetzelfde genoegen eruit te halen?

Extra item 19. Het verlangen gehad om vaker online te zijn op Facebook?

Mood modification

BFAS 3. Facebook gebruikt om persoonlijke problemen te vergeten?

BFAS 9. Facebook gebruikt om gevoelens van, schuld, angst, hulpeloosheid of depressie te verminderen?
BFAS 15. Facebook gebruikt om rusteloosheid/onrust te verminderen?
Relapse
BFAS 4. Meegemaakt dat anderen je vertelden Facebook minder te gebruiken, terwijl je hier niet naar hebt geluisterd?
BFAS 10. Zonder succes geprobeerd om Facebook minder vaak te gebruiken?
BFAS 16. Besloten om Facebook minder vaak te gebruiken, zonder hierin te slagen?

Withdrawal
BFAS 5. Onrustig geworden toen iemand je verzocht Facebook even niet te gebruiken?
BFAS 11. Geirriteerd geraakt toen iemand je verzocht Facebook even niet te gebruiken?
BFAS 17. Je slecht gevoeld omdat je om een of andere reden niet kon inloggen op Facebook?

Conflict
BFAS 6. Meegemaakt dat het Facebook gebruik een slechte invloed had op je werk/studie?
BFAS 12. Minder prioriteit gegeven aan hobby's, vrijetijdsactiviteiten en lichaamsbeweging door Facebook?
BFAS 18. Je partner, familieleden of vriend genegeerd door Facebook?

Facebook anxiety

1. Ik word ongerust/onrustig als ik niet zo vaak op Facebook kan als ik wil.
2. Ik voel me nerveus als ik niet op Facebook kan
3. Ik maak mij zorgen dat ik van alles mis zonder Facebook

Preferences of Facebook use – Passive/Active

Hoe vaak maak je gebruik van de volgende activiteit op Facebook:

- Lezen van berichten in het nieuwsoverzicht
- Plaatsen van berichten (in woorden)
- Reageren op berichten of status updates (in woorden)
- Het delen van berichten of status updates
- Klikken op 'like'
- Reageren op foto's
- Plaatsen van status updates
- Zoeken en bekijken van foto's (browse photos)
- Zoeken en bekijken van profielen (browse profiles)
- Plaatsen van foto's/videos
- Lid worden of zelf creeren van groepen
- Lid worden of zelf creeren van evenementen
- Spelen van games
- Toevoegen of verzoeken van nieuwe vrienden
- Veranderen/updaten van je profiel
- Inchecken
- Chatten/persoonlijke berichten
- Bezoeken van fan pagina's

- Actief zijn op fan pagina's (d.m.v. liken, reageren en/of delen)

Average use on different devices

Hoeveel minuten (gemiddeld) per dag gebruik je Facebook op je tablet?

Hoeveel minuten (gemiddeld) per dag gebruik je Facebook op je mobiele telefoon?

Hoeveel minuten (gemiddeld) per dag gebruik je Facebook op je desktop/laptop?

Hoeveel jaar gebruik je al Facebook? (bij minder dan een jaar is 0,5 een half jaar)

Appendix B: Constructs

Table 4. All constructs, descriptive results of the items and Cronbach's Alfa

	M	SD	α
Facebook addiction	1.73		.90
1. Study influence	1.86	1.05	
2. Less priority to hobbies etc.	1.23	.52	
3. Ignoring partner, family or friends	1.47	.74	
4. Thought about it	3.21	1.02	
5. Spending more time than planned	2.92	1.13	
6. Use to forget about personal problems	1.44	.74	
7. Other told to spend less time	1.34	.70	
8. Troubled not using	1.21	.50	
9. The intention to use less	3.19	1.19	
10. Free more time for use	1.50	.80	
11. Felt an urge to use	1.60	.86	
12. Use to reduce feelings	1.23	.54	
13. Tried to cut down without success	1.55	.86	
14. Becoming irritated not using	1.26	.59	
15. Desire to get more online	1.32	.61	
16. Thought about what is going on	2.36	.99	
17. More use for the same pleasure	1.50	.79	
18. Use to reduce restlessness	1.54	.78	
19. Decided to use less	1.60	.86	
20. Felt bad not logging in	1.26	.53	
Social Loneliness	1.75		.67
1. Part group of friends	1.57	.76	
2. Friends understanding motives	2.02	.75	
3. Don't have friends who share my view	1.73	.79	
4. Depend on friends for help	1.78	.72	

5. Don't have friends who understand me	1.63	.67	
Family Loneliness	1.60		.73
1. Feeling lonely with family	1.46	.74	
2. Depend for support	1.47	.92	
3. Feeling close with family	1.81	.89	
4. Feeling part of family	1.75	.80	
5. Family caring	1.52	.67	
Romantic Loneliness	2.20		.80
1. Share thoughts with romantic partner	2.15	1.26	
2. Romantic partner who gives support	2.07	1.22	
3. wishing more satisfying relationships	2.44	1.09	
4. Contribute to the happiness of partner	2.12	.98	
Depression	1.72		.85
1. Difficulty for initiative	2.17	.96	
2. Feeling downhearted and blue	1.94	.81	
3. Nothing to look forward to	1.81	.83	
4. Experiencing no positive feelings	1.49	.63	
5. Life is meaningless	1.51	.73	
6. Becoming enthusiastic	1.52	.72	
7. Not worth much as a person	1.59	.81	
Social Anxiety	2.43		.84
1. Not liking unknown people around me	2.23	.90	
2. Nervous around unknown people	2.21	.90	
3. Hard to talk to unknown people	2.05	.89	
4. Getting shy with unknown people	2.29	.92	
5. Getting over shyness in new situations	2.64	1.16	
6. Hard to work when someone watch	2.62	1.07	
7. Nervous speaking in front of a group	2.93	1.23	
8. Nervous for large groups	2.48	1.07	
Facebook Anxiety	1.53		.78
1. Becoming restless not getting on FB	1.47	.72	
2. Worried missing things without FB	1.72	.94	
3. Feeling nervous not getting on FB	1.39	.66	

Table 5. Factor analysis – Component Matrix

	Component 1	Component 2
Posting status updates	.82	
Posting messages (in words)	.81	
Posting photo's and video's	.79	
Responding on messages or status updates	.70	
Sharing messages or status updates	.67	
Changing or updating your profile	.66	
Searching and watching profiles		.81
Searching and watching photo's		.80
Reading messages in the news feed		.53

Note: Extraction Method: Principal Component Analysis.

1. Active use of Facebook 2. Passive use of Facebook