

Psychological effects of Facebook use:

links between intensity of Facebook use, envy, loneliness and FoMO

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Abstract

The aim of the present research was to investigate the relationship between intensity of Facebook use, envy, loneliness and FoMO. Eighty-six participants (44 males and 42 females) were collected from the population of Facebook users through snowball sampling. The study used a quantitative method with correlational design to test the hypotheses. Five measures were used to create an online survey, including a demographic questionnaire, the UCLA Loneliness scale, the Fear of Missing Out (FoMO) scale, the Dispositional Envy scale and the Facebook Intensity scale. The link to the survey was available through Facebook for 5 weeks. Results of the analysis have shown no significant relationship between loneliness, envy and intensity of Facebook use. However, further analysis has found a positive association between FoMO and intensity of Facebook use. In addition, results have shown a positive relationship between envy, loneliness and FoMO. Limitations and future direction are discussed.

1. Introduction

Social network sites (SNS) are extremely popular in present days. These sites are web-based services that allow individuals to create a public or semi-public profile, display a list of other users with whom they share a connection with, extend their list of connections and view the connections made by others from one`s circle (Ellison, 2007). SNSs can fundamentally change individuals` social lives on both interpersonal and community level. SNSs replicate features found in earlier communication tools such as messaging, photo sharing or status updates. These enable individuals to broadcast major life events or everyday activities to their social network which usually not only includes close friends, but distant friends, old co-workers or distant relatives. SNSs enable both active and passive communication to its members. Active communication includes private messaging, while passive communication consists of status updates or photo sharing. It lowers the costs of coordinating one`s network as it requires little effort (Ellison, Lampe & Steinfield, 2009).

The most popular SNS is Facebook. Facebook “gives people the power to share and make the world more open and connected. People use Facebook to stay connected with friends and family, to discover what is going on in the world, and to share and express what matters to them” (Facebook Newsroom, 2015). It was founded in 2004, initially for Harvard students. It opened its doors to the general public in 2006. By 2015, Facebook had 1.01 billion daily active users and 1.55 billion monthly active users. It offers a variety of features to its users. The profile feature allows users to express who they are and what is going on in their life by sharing personal information, interests, photos and videos. Status updates are short messages contributed by users that are visible to others through the News Feed. News Feed is a regularly updating list of stories from individuals` connections. Each users` News

Feed is personalized based on their friends` sharing activity. Users can upload an unlimited number of photos, tag friends in photos and create albums as well as upload videos and watch videos uploaded by others. Any of this user generated content can be commented on by other users. In addition, Facebook provides the opportunity for users to send private messages, create groups or organize events. Facebook groups provide a private space for a small group of people, like the user`s family or best friends. With events, people can organize gatherings and invite friends. These events can be anything from a dinner party to a fundraiser (Facebook Newsroom, 2015).

Research on Facebook has shown that it is used to connect with previously existing social connections, rather than meet new people. As a result, connections made on Facebook reflect individuals` offline ties (Smock, Ellison & Lampe, 2011). When a new user registers, Facebook provides the individual with a blank profile which can be personalized by entering information about oneself. This gives the opportunity for users to present themselves authentically and cast themselves in a positive light (Wilson, Gosling & Graham, 2012).

Further research has looked at Facebook profiles in order to decide whether they convey accurate impressions of the users or they present the owner`s ideal-self. Back and colleagues found that SNS profiles express real personalities (Back et al., 2010). This finding can be explained by the sequence of friendship formation on Facebook. Due to the offline to online sequence, users` Facebook friends know the profile owners and can tell if they are presenting inaccurate information on their profile (Wilson et al., 2012). Despite users` profile information accuracy, Facebook provides a platform for self-enhancement and impression management. One way of impression management is by the visual information uploaded by users. Individuals can construct or re-construct their profile images based on the values associated with their ideal-self (Siibak, 2009). This activity was supported by the findings of a qualitative study by DiMicco and Millen (2007) in which they looked at users who were

transitioning between life stages, moving from a college setting to a work setting. It was found that some individuals were aware of the issues of self-presentation on Facebook and managed the impression of the new connections by purposefully “cleansing” their information from the internet, especially photos involving drinking alcohol (DiMicco & Millen, 2007). In addition, status updates are often used by individuals to manage impressions too. Facebook users tend to update their status about positive or major events and when they are feeling well, rather than sharing troubles and bad feelings. It is possible that Facebook users select events based on what they think others will find interesting in order to come across as individuals who do extravagant and interesting things (Denti et al., 2012). Consequently, Facebook use has a great impact on people’s perception of others’ lives. Individuals who have used Facebook longer feel that life is not fair and others are happier and having better lives than they have (Chou & Edge, 2012). They underestimate the negative feelings of others and overestimate the positive ones. It is true for both well-known peers and casual acquaintances. As a result, it can possibly reduce individuals’ well-being and lead to self-evaluative social comparison (Jordan, Monin, Dweck, Lovett, John & Gross, 2011).

Further research in the area of Facebook use has shown additional negative impacts on individuals. The News Feed feature allows individuals to monitor what their friends are up to which is useful for keeping tabs on one’s social network. The accumulation of this knowledge makes individuals aware of their social circle and provides a link to weak ties (Ellison et al., 2009). On the other hand, the excessive information received from status updates can overwhelm individuals. The information overload hypothesis states that rising information leads to decline in processing abilities and results in overload. Information overload takes place when the information supply exceeds the individual’s capacity to process it. It is apparent in the context of Facebook, where users look for new and important information from a wide circle of friends, engage in stalking and view content that is tailored

to them. Usually, the size of one`s network and the quality of the relationship with friends have an impact on the perception of overload. Maintaining large networks of loosely related acquaintances leads to increased amount of updates from contacts the user is not truly interested in and resulting in difficulty of filtering important information and the perception of information overload (Koroleva, Krasnova & Gunther, 2010). This poses a risk to individuals` well-being, increasing stress and reducing attentional capacities (Misra & Stokols, 2011).

1.1 Envy

Envy is “an unpleasant, often painful emotion characterized by feelings of inferiority, hostility, and resentment caused by an awareness of a desired attribute enjoyed by another person or group of persons” (p. 47). These advantages enjoyed by other people have consequences for ones self. People can engage in upward social comparison which forms the basis of self-evaluation. Noticing another person`s advantage can reflect poorly on ones self and lead to negative emotions. Envy is likely to arise when the advantaged person has similar characteristics to oneself and their advantage is self-relevant. The similarity with the envied person creates a sense of possibility and an expectation that it should happen to oneself, however the possibility seems unlikely. The advantage of the envied person is likely to be perceived as unfair, giving envy its painful emotional characteristics (Smith & Kim, 2007).

Envy and Facebook Use. Facebook makes social comparison easier than ever. Users have access to status updates, photos and personal information from hundreds of people. Given that most people post positive and interesting information about themselves, regularly reading up on what others are doing and comparing it to one`s own activities, may provide a false perception of others by seeing them as more interesting and successful (Denti et al.,

2012). A study by Chou and Edge (2012) indicated that individuals who used Facebook longer and spent more time on Facebook each week agreed more on that others were happier, had better lives than they had and felt that life is unfair. Krasnova et al. (2013) studied envy incidents triggered by Facebook. Facebook provides a ground for envy, which is induced when new information is learned about others. The site offers an easy way for users to compare themselves against their friends, inducing engagement in upward social comparison and resulting in feelings of envy due to the impression management and self-promotion of users. Findings of the study revealed that passive following of others and social information consumption trigger invidious feelings. Users are mainly envying the happiness of others, the way they socialize and spend their vacations. This positive finding was supported by Tandoc, Ferrucci and Duffy (2015) who found that heavy Facebook users have higher levels of envy than light users. Heavy users are more likely to engage in behaviours that lead to the consumption of others' personal information, providing more instances for social comparison. However, contradicting the findings of Chou and Edge (2012), they did not find an association between the size of individuals' network and the information consumption level which resulted in no relationship between the number of friends and level of envy. Building upon previous research, Lin and Utz (2015) incorporated the role of tie strength into feelings of envy in the context of Facebook. They have found that users are more likely to be happy for their friends with whom they share a strong tie with rather than feeling envy when they post a positive update. In addition, if envy is experienced by the user it is more likely to be benign, a positive type of envy that has a levelling-up effect.

The relationship between envy and Facebook use have not been studied extensively and findings are limited. Limitations of previous studies involve only looking at the concept of envy and Facebook use in terms of time spent on the site, frequency of different feature uses and number of friends (Tandoc et al., 2015) and passive following of others (Krasnova

et al., 2013). Further limitation included the use of a student sample in both studies. In addition, Krasnova et al. (2013) measured “Facebook Envy”, a newly developed concept and measure. The present study aims to extend the existing research literature on the relationship between envy and Facebook use and address the limitations of previous studies.

1.2 Loneliness

Loneliness is defined as a “complex set of feelings encompassing reactions to the absence of intimate and social needs” (p. 1). Those who are lonely may be experiencing either social or emotional loneliness. Social loneliness is a desire for membership in a group of friends, while emotional loneliness is a desire for a one-on-one relationship (Ernst & Cacioppo, 2000).

Loneliness and Facebook Use. Early research on internet use have studied the impact of the internet on individuals` well-being and suggested that the internet creates a lonely crowd in cyberspace by isolating them from the real world (Kraut, Patterson, Lundmark, Kiesler, Mukophadhyay & Scherlis, 1998). However, the rise of SNSs have shown that the internet does not necessarily impact people in a negative way. SNSs enable the kinds of relationship developments that result in bridging and bonding social capital and increases users` perception of social capital (Steinfeld, Ellison, Lampe & Vitak, 2010). SNSs do not remove people from their offline world, instead sites like Facebook provide its users with an effective way to keep in touch with friends and acquaintances (Ellison, Steinfeld & Lampe, 2007).

Research by Ellison et al. (2007) found a robust connection between Facebook use and social capital. Intensity of Facebook use predicted social capital accumulation. Lou, Yan, Nickerson and McMorris (2012) have found that intensity of Facebook use had a positive

impact on loneliness as spending more time on Facebook allowed users to extend their social network, connect with relatives and their offline friends, resulting in a reduction in their loneliness.

Building upon these findings, Burke, Marlow and Lento (2010) compared self-reported measures of Facebook use, with objective data to measure participants online activities. They confirmed survey-based findings that Facebook use increases social capital. They also investigated users' consumption of friends' content, such as status updates, photos and open conversations with other friends. Users, who consumed greater levels of content reported reduced social capital and increased levels of loneliness. The result is not surprising as people who feel a discrepancy between the social interaction they have and the social interaction they desire tend to spend more time observing others' interactions. In addition, Jin (2013) has shown that loneliness is inversely related to communicating activities on Facebook. Lonely individuals engaged in less communication on Facebook than non-lonely individuals. It is supported by the findings of Deters and Mehl (2012) which revealed that engaging in communication on Facebook, such as through status updates, individuals' feelings of loneliness reduces. It is accounted for by feeling more connected and in touch with friends on a regular basis and letting them take part in one's life. However, a conflicting research suggests that because of users' impression management and self-promotion individuals underestimate the extent to which other people suffer from negative emotional experiences and overestimate the extent of others' positive emotions. As a result, users experience greater levels of loneliness and reduced satisfaction with life (Jordan et al., 2011).

There is an extensive research literature available on the relationship between loneliness and Facebook use, however findings are conflicting. The present research aims to re-examine the relationship between individuals' level of loneliness and the intensity of their Facebook use.

1.3 Fear of Missing Out

Fear of missing out (FoMO) is a “pervasive apprehension that others might be having rewarding experiences from which one is absent. It is characterized by the desire to stay continually connected with what others are doing” (Przybylski, Murayama, DeHaan & Gladwell, 2013, p. 1841). Due to smartphones and real-time digital updates, FoMO is going into overdrive in today`s society. Social media makes people aware of what is happening in the life of others and it can foster feelings of inadequacy and anxiety. People like to be in the know, which is hard to achieve with the amount of videos to watch or information to read on social media. It is inevitable to miss out on things (Vaughn, 2012).

FoMO and Facebook use. The first empirically based evidence and theoretically grounded examination of the fear of missing out phenomenon was done by Przybylski et al (2013). According to them, FoMO can be understood as a self-regulatory limbo which arises from deficits in psychological need satisfactions. The psychological needs include need for competence, need for autonomy and the need for relatedness. Low levels of basic need satisfaction may relate to FoMO and social media use in two ways. Either individuals low on need satisfaction gravitate toward social media as a mean to get in touch with others and develop social competence or FoMO serves as a mediator, linking deficits in needs to social media use. Furthermore, a potential link have been proposed between FoMO and psychological health and well-being as social media affords an outlet for social and emotional frustration. Results from the study by Przybylski et al (2013) indicated that individuals high in FoMO reported lower levels of general mood and lower levels of life satisfaction. In addition, FoMO was related to engagement in Facebook. Individuals higher on FoMO checked their Facebook account more frequently.

Facebook is connected to FoMO by the impression management it provides to users. Individuals present the best version of themselves by censoring what they post (Grohol, 2013). It is likely that individuals select events that others might find interesting in order to come across as someone who does extravagant, funny and interesting things. When Facebook users compare their own lives with others` seemingly more successful and happier lives, they may feel that their own lives are less successful in comparison. This comparison is made easy by the status updates, pictures and personal information posted by one`s friends (Denti et al., 2012). As a result, individuals overestimate others` happiness and think that their peers are going out with friends and attending parties more than they actually are (Jordan et al., 2011) and think that they are happier and having better lives than they do (Chou & Edge, 2012).

Two more empirical studies have been found to investigate FoMO. Alt (2015) looked at the possible link between FoMO, social media engagement and motivation of college students. He found that FoMO played a mediating role between social media engagement and extrinsic motivational factors as well as amotivation. The study by Riordan, Flett, Hunter, Scarf and Conner (2015) looked at how FoMO relates to college students` alcohol use and alcohol-related consequences. The results suggested that FoMO did not predict overall alcohol use, but higher FoMO was associated with more negative alcohol-related consequences.

The present study aims to add to the existing literature by examining whether FoMO relates to intensity of Facebook use. Previous research only looked at this relationship with measuring when and how frequently individuals use Facebook (Przylybski et al., 2013). Additional study looked at the link between Facebook use and FoMO in a student sample by measuring social media engagement with subscales of social engagement, news information engagement and commercial information engagement, a newly developed measure (Alt, 2015). The present study addresses these limitations by using a sample from the general

population and measuring Facebook use by the Facebook Intensity scale. This measure incorporates individuals' emotional connectedness to Facebook, the amount of time spent on the site and the number of Facebook friends the individuals have, giving a total score of intensity of Facebook use (Ellison, Steinfield & Lampe, 2007).

FoMO, Envy and Loneliness. Previous research indicated a relationship between Facebook use and envy. It was proposed that as a common reaction to envious feelings, users may engage in more self-promotion and impression management as an overstatement of personal accomplishment. This behaviour triggers a self-promotion – envy spiral, where users react to the self-promotion of others with even more self-promotion (Krasnova et al., 2013). FoMO is triggered by individuals' false presentation of their life (Grohol, 2013), misperception of it by the user (Jordan et al., 2011) and it drives individuals to constantly check their social network and look for better opportunities (Przylybski et al., 2013). Furthermore, information consumption on Facebook has been linked to increased levels of loneliness (Burke et al., 2010). As FoMO drives individuals to regularly check Facebook and see what is going on, exposing them to more social information. The present study aims to examine whether FoMO is related to loneliness and envy. Are individuals afraid they miss out on an opportunity, because they envy their peers who got to attend? In addition, do individuals who suffer from fear of missing out also suffer from feelings of loneliness? These questions have not been examined or answered in the past. The purpose of the study is to extend the research literature on the phenomenon of fear of missing out.

1.4 Rational

In summary, Social Network Sites are extremely popular in today's society, with over 1 billion daily users on sites like Facebook (Facebook Newsroom, 2015). The relationship

between envy and Facebook has not been studied extensively and findings are limited. The present study aims to extend the existing research literature on the relationship between envy and Facebook use and address the limitations of previous studies. This study will attempt to do this by using a sample from the general population instead of a student sample and measure variables with well-established questionnaires, including the Facebook Intensity scale and the Dispositional Envy Scale.

In addition, the present research aims to re-examine the relationship between individuals' level of loneliness and the intensity of their Facebook use. There is an extensive research literature available on the relationship between these two variables, however research findings are conflicting. The current study will attempt to examine whether intensive Facebook use is related to increased or decreased levels of loneliness, by measuring variables with the UCLA Loneliness Scale and the Facebook Intensity Scale.

A pronounced phenomenon in the age of social media is the concept of fear of missing out (Vaughn, 2012). FoMO is assumed to be connected to the use of SNSs, however empirical evidence is limited. To extend the research literature on the relationship between these two variables and address some of the limitations of previous ones, the present study aims to examine whether FoMO is related to intensity of Facebook use. It will attempt to do this by using a sample from the general population of Facebook users and measure variables with the Fear of Missing Out Scale and the Facebook Intensity Scale.

Furthermore, the research on the correlates of FoMO is limited. The purpose of the present study is to establish a relationship between FoMO, envy and loneliness. This link has not been studied in the past and the current study could provide a better understanding of the correlates of FoMO.

1.5 Hypotheses

H1: It is hypothesized that there is a statistically significant relationship between envy, loneliness and intensity of Facebook use.

H2: It is hypothesized that there is a statistically significant relationship between intensity of Facebook use and Fear of Missing Out (FoMO).

H3: It is hypothesized that there is a statistically significant relationship between Fear of Missing Out (FoMO), envy and loneliness.

2. Methodology

2.1 Participants

A snowball sample of 86 participants was collected for the current study. Participants were drawn from the general population of Facebook users by using an anonymous online survey. Participants were recruited by the use of Facebook status updates being posted on the researcher's personal Facebook profile, by private messages sent out to some Facebook friends of the researcher and by a status update posted in one Facebook group, of which the researcher is a member of. The status updates and the private messages included the link to the online survey, asking Facebook users to participate in the research and invite their friends to participate too. Participation in the study was voluntary and no incentives were offered to take part.

The age of the participants ranged from 18 to 55. There were 20 (23.3%) participants in the 18 to 25 years old category, 42 (48.8%) participants in the 26 to 35 years old category, 22 (25.6%) participants in the 36 to 45 years old category and 2 (2.3%) participants in the 46 to 55 years old category. For statistical analysis the 46 to 55 years old category was amalgamated with the 36 to 45 years old category due to low numbers of participants. Of the total sample gathered, 44 (51.2%) respondents were male and 42 (48.8%) respondents were female.

2.2 Design

The current study used a quantitative research method with correlational design to test the hypotheses. The predictor variables of this study included loneliness and envy when testing Hypothesis 1 and Hypothesis 3. The predictor variable in Hypothesis 2 was intensity of Facebook use. The criterion variable of this study was intensity of Facebook use in Hypothesis 1 and fear of missing out in Hypothesis 2 and 3.

2.3 Materials

Materials used in the study included one information sheet and one confirmation page. In addition, the study used five quantitative measures to create the online survey, including a demographic questionnaire, the UCLA Loneliness scale (Version 3) (Russel, 1996), the Fear of Missing Out scale (Przybylski et al., 2013), the Dispositional Envy scale (Smith, Parrott, Diener, Hoyle & Kim, 1999) and the Facebook Intensity scale (Ellison, Steinfield & Lampe, 2007).

The information sheet (See Appendix A) included information about the nature of the study, its anonymity and confidentiality and the rights of the participants who decide to take part. In addition, this information sheet served as a consent form, where participants agreed to take part in the study. The confirmation page (See Appendix B) was presented to participants after they have submitted their responses. It thanked them for participation and provided the contact details of two organizations in case the participant experienced any distress.

The demographic questionnaire (See Appendix C) was comprised of two questions. One question asked about the participants' gender while the other question asked about the participants' age where they could select the appropriate category out of 5 categories.

The UCLA Loneliness Scale (Version 3) (Russel, 1996) (See Appendix D) was used to measure participants' subjective feelings of loneliness and social isolation. The measure

consisted of 20 items, each answered on a 4-point Likert scale where 1 indicated “never” and 4 indicated “often”. The scale included questions like “How often do you feel that you lack companionship?” and “How often do you feel outgoing and friendly?”. Out of the 20 questions 9 questions were reverse scored. The total score was computed by adding up the responses for the 20 items. Total scores could range from 20 to 80, with higher scores reflecting greater feelings of loneliness. The scale has been found to have high internal consistency with the result of .897 for Cronbach’s alpha.

The Fear of Missing Out scale (Przybylski et al., 2013) (See Appendix E) was used to measure individual differences in feelings of fear of missing out. The measure consisted of 10 items, each answered in a 5-point Likert scale where 1 indicated “not at all true of me” and 5 indicated “extremely true of me”. The scale included statements like “I fear others have more rewarding experiences than me” and “I get worried when I find out my friends are having fun without me”. The total score was computed by averaging the responses of all 10 items. The total scores could range from 1 to 5, with higher scores reflecting a greater tendency to experience fear of missing out. The scale has been found to have high internal consistency with the result of .854 for Cronbach’s alpha.

The Dispositional Envy Scale (Smith et al., 1999) (See Appendix F) was used to measure individual differences in tendencies to envy. The measure consisted of 8 items, each answered on a 5-point Likert scale where 1 indicated “strongly disagree” and 5 indicated “strongly agree”. The scale included statements like “The bitter truth is that I generally feel inferior to others” and “It is frustrating to see some people succeed so easily”. The total score was computed by adding up the responses of the 8 items. The total scores could range from 8 to 40, with higher scores reflecting a greater tendency to experience envy. The scale has been found to have high internal consistency with the result of .905 for Cronbach’s alpha.

The Facebook Intensity scale (Ellison et al., 2007) (See Appendix G) was used to measure individuals' Facebook usage, emotional connectedness to the site and its integration into their daily activities. The measure consisted of 8 items. The first 6 items were rated on a 5-point Likert scale, one item was rated on a 5-point ordinal scale and one item was rated on a 10-point ordinal scale. Responses to the 5-point Likert scale questions ranged from "strongly disagree" to "strongly agree". These items included statements like "Facebook is part of my everyday activity" and "I am proud to tell people I am on Facebook". The 5-point ordinal scale was used to measure how much time the participant spends on actively using Facebook each day. Responses were comprised of "0-29 minutes", "30-59 minutes", "60-89 minutes", "90-119 minutes" and "120 minutes or more". The 10-point ordinal scale was used to measure the number of Facebook friends each participant has. Responses for this question ranged from "10 or less" to "more than 400". After the 10-point ordinal scale has been transformed into a 5-point scale, the total score was computed by averaging the responses of all 8 items. The total scores could range from 1 to 5, with higher scores reflecting a greater intensity of Facebook use. The scale has been found to have high internal consistency with the result of .852 for Cronbach's alpha.

2.4 Procedure

The online survey was available on Google Docs for 5 weeks and a message was posted on the researcher's personal Facebook profile, in a Facebook group the researcher is a member of and 10 people were selected from the researcher's Facebook friends and received a private message. Both the status update and the private message included the link for the online survey and requested volunteers to take part in the study and requested the link to be forwarded to friends. In addition, the message included the nature of the study and the time

required to complete the survey. Once the link was clicked on, the participants were taken to the information sheet. The information sheet provided information regarding the voluntary nature of the study, anonymity, data protection and the right to withdraw. Participants were informed that the study would be looking at the psychological effects of Facebook use and they were provided with the contact details of the researcher and the researcher's supervisor whom they can contact for further information. In order to comply with the ethical guidelines, it was stated that only those 18 years of age and over were permitted to take part in the study and by completing and submitting the survey they are consenting to participate in the study.

After reading the information sheet, the participants had to click on the continue button which took them to the first set of questions, asking for demographic information. When responses were completed on one page participants had to click on the continue button to go to the next page. The next set of questions were to determine participants' level of loneliness. This was followed by questions to determine the level of fear of missing out they experienced, then questions to determine participants' tendency to experience envy. Finally the last set of questions were used to determine participants' intensity of Facebook use. On completion of all questions, participants had to click on the submit button which took them to the confirmation page. Here they were thanked for their participation and were given the contact details of two organizations in case they have experienced any issues or distress from completing the survey.

3. Results

3.1 Descriptive Statistics

Table 1 below shows the descriptive statistics of all participants' score for the UCLA Loneliness Scale, the Fear of Missing Out scale, the Dispositional Envy scale and the Facebook Intensity scale. The table displays the mean, standard deviation, minimum and maximum value, range and variance for each psychological measure.

Table 1. *Descriptive statistics of psychological measures*

	Mean	SD	Minimum	Maximum	Range	Variance
Loneliness	42.10	10.13	24.00	68.00	44.00	102.66
FoMO	2.35	.79	1.00	4.90	3.90	.63
Envy	15.34	7.38	8.00	35.00	27.00	54.51
Intensity of Facebook use	3.13	.95	1.00	4.88	3.88	.90

Table 2 below shows the mean and standard deviation of each psychological measure for males and females. Males scored slightly higher on loneliness (M=42.55, SD=11.39), FoMO (M=2.39, SD=.71) and intensity of Facebook use (M=3.21, SD=1.02). It suggests that males feel more lonely, experience higher rates of FoMO and they use Facebook more

intensely than females. On the other hand, females scored slightly higher on envy ($M=15.60$, $SD=8.09$). It suggests that females have a higher tendency to envy others than males.

Table 2. *Descriptive statistics of psychological measures by gender*

Variable	Males			Females		
	N	Mean	SD	N	Mean	SD
Loneliness	44	42.55	11.39	42	41.64	8.74
FoMO	44	2.39	.71	42	2.31	.88
Envy	44	15.09	6.73	42	15.60	8.09
Intensity of Facebook use	44	3.21	1.02	42	3.06	.88

Table 3 below shows the descriptive statistics of the psychological measures for each age group. Participants in the 18 to 25 years old category scored the highest and participants in the 36 years old or over category scored the lowest on all variables. Participants' score of loneliness did vary significantly amongst the three age groups (see Figure 1), but the scores on intensity of Facebook use showed a gradual decrease (see Figure 2). Participants' score on fear of missing out and envy showed a higher drop between the ages of 18 to 25 and 26 to 36 than between the ages of 26 to 35 and 36 or over.

Table 3. *Descriptive statistics of psychological measures by age groups*

Variables	18 to 25			26 to 35			36 or over		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
Loneliness	20	42.20	9.09	42	42.14	11.29	24	41.96	9.17
FoMO	20	2.88	.99	42	2.25	.68	24	2.10	.58
Envy	20	18.50	9.25	42	14.40	6.58	24	14.33	6.50
Intensity of Facebook use	20	3.47	.81	42	3.16	.90	24	2.81	1.07

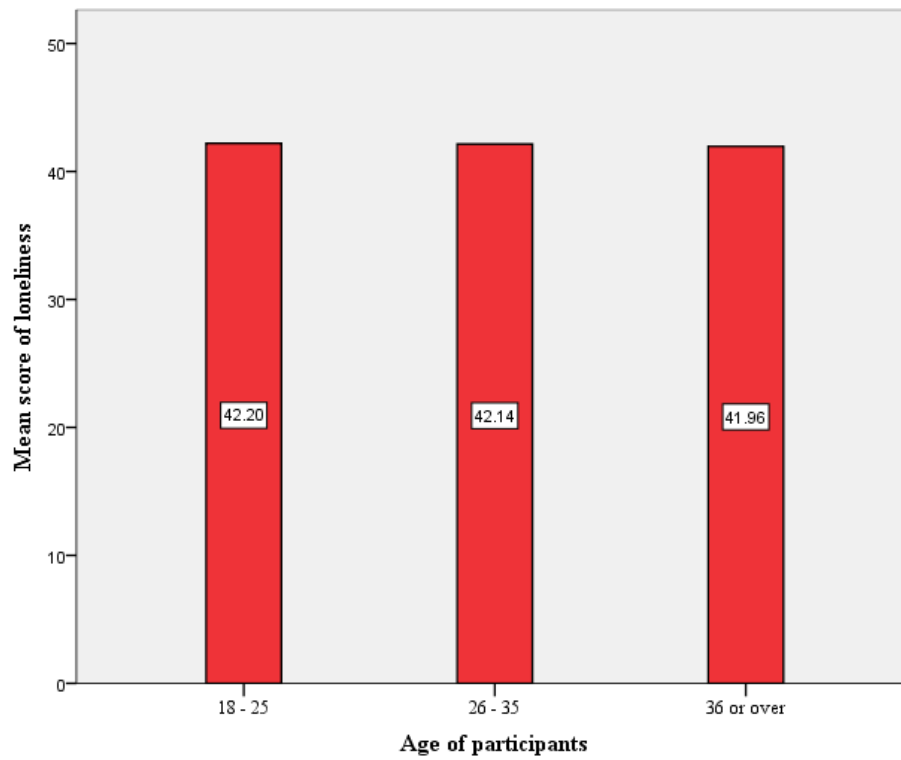


Figure 1. Mean score of loneliness divided by age

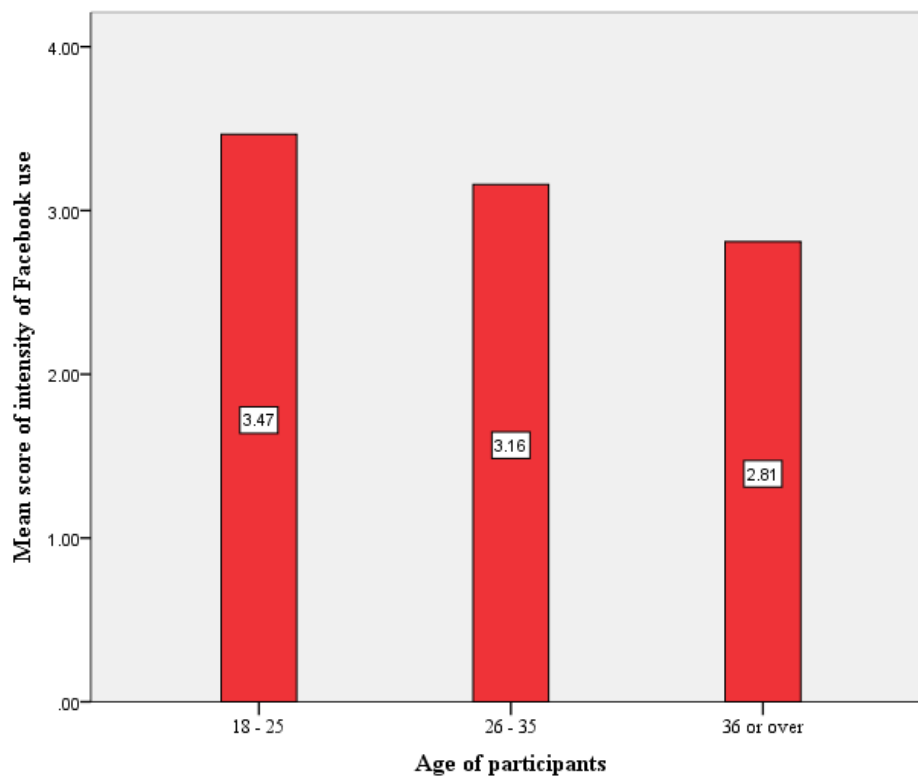


Figure 2. Mean score of intensity of Facebook use divided by age

3.2 Inferential statistics

Hypothesis 1. It was hypothesized that there is a statistically significant relationship between envy, loneliness and intensity of Facebook use. A Shapiro-Wilk test of normality found normal distribution of loneliness ($p=.197$) and intensity of Facebook use ($p=.093$). However, the test did not find envy to be normally distributed ($p<.001$). Testing the hypothesis, a Pearson's r correlation found no statistically significant relationship between individuals' level of loneliness and their intensity of Facebook use ($r(84)=.03$, $p=.765$). In addition, a Spearman's ρ correlation found that there was no statistically significant relationship between individuals' tendency to envy and their intensity of Facebook use ($r_s(84)=.17$, $p=.121$) (see Table 4). The results indicate that individuals' feelings of loneliness and envy is not affected by how intensely they use Facebook and vice versa.

Hypothesis 2. It was hypothesized that there is a statistically significant relationship between intensity of Facebook use and FoMO. A Shapiro-Wilk test of normality did not find FoMO to be normally distributed ($p=.005$). Testing the hypothesis, a Spearman's ρ correlation found moderate positive statistically significant association between individuals' level of FoMO and their intensity of Facebook use ($r_s(84)=.39$, $p<.001$) (see Table 4). The result indicated that individuals who use Facebook more intensely will experience stronger feelings of FoMO. The two variables explained 39% of the variance.

Hypothesis 3. It was hypothesized that there is a statistically significant relationship between FoMO, envy and loneliness. A Spearman's ρ correlation found strong positive statistically significant relationship between individual's tendency to envy and their level of FoMO ($r_s(84)=.59$, $p<.001$) with 59% of variance explained. In addition, a Spearman's ρ correlation found moderate positive statistically significant relationship between individuals'

level of loneliness and their level of FoMO ($r(84)=.36$, $p<.001$) with 36% of variance explained (see Table 4). The results indicate that individuals who are more likely to envy and feel lonelier will have stronger feelings of FoMO and vice versa.

Table 4. *Correlation between the psychological measures*

Variable	Loneliness	FoMO	Envy	Intensity of Facebook use
Loneliness	1			
FoMO	.36**	1		
Envy	.46**	.59**	1	
Intensity of Facebook use	.03	.39**	.17	1

**Correlation is significant at the 0.01 level (2-tailed)

Exploratory analysis. Table 5 below shows the correlation between the psychological measures, individuals' time spent on Facebook per day and the number of friends they have on Facebook. An exploratory analysis looked whether time spent using Facebook and the size of the participants' social network is associated with feelings of

loneliness, FoMO and envious feelings. A Spearman's rho correlation did not find feelings of loneliness to be significantly associated with time spent on Facebook ($r(84)=.11$, $p=.297$) nor with the number of Facebook friends individuals have ($r(84)=.09$, $p=.39$). In addition, a Spearman's rho correlation did not find the number of Facebook friends to be significantly associated with FoMO ($r(84)=.16$, $p=.144$) nor with envy ($r(84)=.08$, $p=.49$). However, a Spearman's rho correlation found a moderate positive statistically significant relationship between time spent on Facebook and individuals' feelings of FoMO ($r(84)=.38$, $p<.001$) with 38 % of the variance explained and a weak positive statistically significant relationship between time spent on Facebook and individuals' tendency to envy ($r(84)=.28$, $p=.008$) with 28% of the variance explained. The findings indicate that the more time individuals spend using Facebook the more they experience feelings of FoMO and envy.

Table 5. *Correlation between the psychological measures, time spent on Facebook and number of Facebook friends*

Variable	Loneliness	FoMO	Envy	Time on Facebook	Facebook friends
Loneliness	1				
FoMO	.36**	1			
Envy	.46**	.59**	1		
Time on Facebook	.11	.38**	.28**	1	
Facebook friends	.09	.16	.08	.46**	1

**Correlation is significant at the 0.01 level (2-tailed)

4. Discussion

4.1 Aim of research

The aim of the current research was to investigate the relationship between intensity of Facebook use, envy, loneliness and FoMO. The current research aimed to examine the association between individuals' tendency to envy, level of loneliness and their intensity of Facebook use. It was hypothesized that there would be a significant relationship between envy, loneliness and intensity of Facebook use. In addition, the current research aimed to look at the relationship between individuals' level of FoMO and their intensity of Facebook use. It was hypothesized that there would be a significant relationship between FoMO and intensity of Facebook use. Lastly, the research aimed to examine the relationship between individuals' level of FoMO, their tendency to envy and level of loneliness. It was hypothesized that there would be a significant relationship between FoMO, envy and loneliness.

4.2 Summary and Discussion of findings

Results of the analysis have shown no significant relationship between individuals' level of loneliness, tendency to envy and their intensity of Facebook use. These findings did not support the hypothesis which stated that there would be a significant relationship between these three variables. Further analysis, however, has shown a moderate positive association between individuals' level of FoMO and their intensity of Facebook use. This finding did support the hypothesis, which anticipated that there would be a significant relationship between these two variables. Results of the analysis have also shown a strong positive relationship between individuals' tendency to envy and their level of FoMO as well as a moderate positive relationship between individuals' level of FoMO and loneliness. These findings did support the hypothesis which stated that there would be a significant relationship between FoMO, envy and loneliness. In addition, some exploratory analysis has shown a moderate positive relationship between individuals' level of FoMO and the amount of time spent on Facebook daily. In addition, a weak positive relationship was found between individuals' tendency to envy and the amount of time spent on Facebook daily. However, the analysis did not show significant relationship between levels of loneliness and the time spent using Facebook nor between the number of Facebook friends individuals have and their level of loneliness, FoMO or tendency to envy.

Hypothesis 1 stated that there would be a significant relationship between envy, loneliness and intensity of Facebook use, however this was not supported by the results of the analysis. This finding contradicts the study by Krasnova et al. (2013) who have found a significant relationship between Facebook use and envy and it also contradicts the findings of Tandoc et al. (2015) who has found higher levels of envy in users who have used Facebook more heavily. A speculative explanation of the contradiction suggests that the difference could be due to the measures used to assess Facebook use. Research by Krasnova et al. (2013) focused on passive use of Facebook and research by Tandoc et al. (2015) focused on

time spent on Facebook. The current research measured intensity of Facebook use which incorporated individuals' emotional connectedness to Facebook as well as the time spent on the site and the size of individuals' network. The inconsistency in measures could explain the contradiction between the findings. This explanation is supported by the result of the exploratory analysis which did find a weak association between individuals' tendency to envy and the time they spend on Facebook daily, supporting the research findings of Tandoc et al. (2015). In addition, the exploratory analysis showed that there is no association between individuals' tendency to envy and the number of Facebook friends they have, which is consistent with the findings of Chou and Edge (2012) who did not find an association between these two variables either.

In addition, the lack of relationship between individuals' level of loneliness and their intensity of Facebook use in the current research did contradict the findings of Burke et al. (2010), Jin (2013) and Deters and Mehl (2012). The inconsistency of the findings could be due to the way Facebook use was measured. Burke et al. (2010) focused on passive consumption of information when measuring Facebook use, while Jin (2013) and Deters and Mehl (2012) looked at users' communicating activities on Facebook. The result of the analysis contradicted the findings of Lou et al. (2012) as well, who did find intensity of Facebook use to be negatively related to loneliness. It is speculated that this contradiction was the result of the different samples used in the two studies. Lou et al. (2012) conducted their research using a student sample which might have made their findings less generalizable. On the other hand, the current research used a sample from the general population of Facebook users, reaching a wider and more representative range of participants.

Hypothesis 2 stated that there would be a significant relationship between intensity of Facebook use and FoMO, which was supported by the result of the analysis. The present result is in line with previous findings by Przybylski et al. (2013) who did find increased

engagement with Facebook to be related to increased level of FoMO. It is further supported by the result of the exploratory analysis, which did find an increase in FoMO when daily Facebook activity increased. This provides an evidence for the theoretical view of FoMO, stating that individuals feel a need to stay continually connected with what others are doing as they fear that others are having better experiences. However, it is not possible to tell whether increased Facebook use triggers feelings of FoMO or experiencing FoMO drives individuals to login to Facebook more frequently.

Hypothesis 3 stated that there would be a significant relationship between FoMO, envy and loneliness, which was supported by the analysis. The finding provides a better understanding of the phenomenon of FoMO. The finding provides a support for the view which suggests that individuals engage in social comparison based on the information provided on SNSs like Facebook (Denti et al., 2012) and believe their peers are attending more social events (Jordan et al., 2012) and live a happier lives (Chou & Edge, 2012), which evokes envious feelings and feelings of loneliness. They envy their peers, feel less connected to them and they are suffering from the fear that they are missing out on something important. However, it is not possible to decide whether individuals who are more likely to envy are more prone to feelings of FoMO or feelings of FoMO evokes envious feelings. It is also hard to decide whether individuals feel lonely because they fear that they are missing out or they fear to miss out on an event because they feel lonely and socially isolated.

4.3 Strengths and Limitations

The current study, like any other empirical research, has its limitations. The sample size was relatively small (N=86) compared to previous studies. It was sufficient to reliably run a statistical analysis, however the study could have benefited from a larger sample size

which could have been a better indication of the population. Furthermore, participants' age was not evenly distributed with half of the participants being located in the 26 to 35 year old category. The overrepresentation of this group could have affected the findings. Despite the limitations of the sample size and uneven distribution of participants in the age groups, the study did show strengths as well. These included the even distribution of males and females taking part in the study. Furthermore, sample collection from the general population of Facebook users instead of the use of a student sample, contributed to the generalizability of the findings.

Another limitation derived from the self-reported nature of the questionnaires. Information reported by participants may have reflected socially desirable responses, rather than participants' true responses. This is especially true for the Dispositional Envy scale, in which participants' average score was low. Further limitation of the study derived from the use of the Facebook Intensity scale as an indication of Facebook use. Its biggest flaw derives from the fact that it does not discriminate between passive and active use of Facebook. As shown by previous research, actively using Facebook to communicate or passively reading the content posted by peers can have a very different effect on individuals. The present study could have benefited from this distinction by looking at how active use and passive use of Facebook are related to envy, loneliness and FoMO. Despite limitations of the mentioned measures, all of the measures used in the study did show high internal consistency. Some limitations of the study derived from the research design as well. Due to its correlational nature, it is not possible to establish a causal link between variables.

4.4 Future direction

Based on the findings and limitations of the present study, it is recommended that future research should be directed toward developing a measure of Facebook use that accounts for and distinguishes between passive and active use of Facebook. By the use of such measure, a better and more accurate understanding could be gained about the relationship between the variables the current study looked at. Future research should also take the direction toward incorporating self-presentation, social comparison and information consumption on Facebook into the study of envy, loneliness and FoMO, as they are assumed to play an important role in Facebook use. Further research is necessary to identify further correlates of FoMO too, as research literature on and understanding of this phenomenon is still limited. In addition, future research is recommended to address and eliminate the limitations of the current study which derived from the sample.

4.5 Implications

Although there were certain limitations to the study, the findings of the research highlighted some of the negative impacts Facebook use can have on its users. The research could serve as a basis for future research on this topic and bring awareness to the negative effects of Facebook use. Interventions could be designed and implemented to help individuals to process the increased information available to them on Facebook, which could reduce envious feelings and feelings of FoMO experienced.

4.6 Conclusion

In conclusion, the present research has found no significant relationship between loneliness, envy and intensity of Facebook use. This could be attributed to the use of the Facebook Intensity scale. However, a positive significant relationship was found between

intensity of Facebook use and FoMO. This indicates that the more intensely Facebook is used by an individual the higher rate of FoMO will be experienced and vice versa. In addition, a positive significant relationship was found between envy, loneliness and FoMO too. It indicates that individuals who are more likely to envy others or feel lonely and socially isolated will experience higher rates of FoMO. Further analysis have found that the amount of time spent on Facebook daily by an individual was associated with envious feelings and FoMO, but the number of Facebook friends was not related to any of the measured variables. Some limitations of the study arose and future research is recommended to build upon the current findings and address the limitations.

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Appendices

Appendix A. Information sheet

Psychological effects of Facebook use

My name is Eniko Varga and I am a final year student of Psychology in Dublin Business School. I am conducting research about the psychological effects of Facebook use. This research is being conducted as part of my studies and will be submitted for examination.

You are invited to take part in this study and participation involves completing the attached anonymous survey. While the survey asks some questions that might cause some minor negative feelings, it has been used widely in research. If any of the questions do raise difficult feelings for you, contact information for support services is included on the final page.

Participation is completely voluntary and so you are not obliged to take part. Participation is anonymous and confidential. Thus responses cannot be attributed to any one participant. For this reason, it will not be possible to withdraw from participation after the questionnaire has been submitted. The data from the questionnaires will be stored on a password protected computer.

It is important that you understand that by completing and submitting the questionnaire that you are consenting to participate in the study and you confirm that you are over the age of 18.

Should you require any further information about the research, please contact:

Eniko Varga,.

My supervisor Dr Patricia Orr can be contacted at

Thank you for taking the time to complete this survey.

Appendix B. Confirmation sheet

Thank you for completing the survey. Your participation is much appreciated.

If the questions has raised some issues or distress, you can contact:

the Aware Support Line 1890 303 302 or

the Samaritans Support Line (01) 116 123

Appendix C. Demographic questionnaire

Please select the appropriate answer.

What is your gender?

1. Female
2. Male

What is your age?

1. 18 to 25 years
2. 26 to 35 years
3. 36 to 45 years
4. 46 to 55 years
5. Age 56 or older

Appendix D. UCLA Loneliness Scale (Version 3)

Indicate how often each of the statements below is descriptive of you.

1 – Never

2 – Rarely

3 – Sometimes

4 – Often

How often do you feel that you are "in tune" with the people around you?*

1 2 3 4

How often do you feel that you lack companionship?

1 2 3 4

How often do you feel that there is no one you can turn to?

1 2 3 4

How often do you feel alone?

1 2 3 4

How often do you feel part of a group of friends?*

1 2 3 4

How often do you feel that you have a lot in common with the people around you?*

1 2 3 4

How often do you feel that you are no longer close to anyone?

1 2 3 4

How often do you feel that your interests and ideas are not shared by those around you?

1 2 3 4

How often do you feel outgoing and friendly?*

1 2 3 4

How often do you feel close to people?*

1 2 3 4

How often do you feel left out?

1 2 3 4

How often do you feel that your relationships with others are not meaningful?

1 2 3 4

How often do you feel that no one really knows you well?

1 2 3 4

How often do you feel isolated from others?

1 2 3 4

How often do you feel you can find companionship when you want it?*

1 2 3 4

How often do you feel that there are people who really understand you?*

1 2 3 4

How often do you feel shy?

1 2 3 4

How often do you feel that people are around you but not with you?

1 2 3 4

How often do you feel that there are people you can talk to?*

1 2 3 4

How often do you feel that there are people you can turn to?*

1 2 3 4

*Question is reverse scored

Appendix E. Fear of Missing Out scale

Below is a collection of statements about your everyday experience. Using the scale provided please indicate how true each statement is of your general experiences. Please answer according to what really reflects your experiences rather than what you think your experiences should be.

Please treat each item separately from every other item.

1 – Not at all true of me

2 – Slightly true of me

3 – Moderately true of me

4 – Very true of me

5 – Extremely true of me

I fear others have more rewarding experiences than me.

1 2 3 4 5

I fear my friends have more rewarding experiences than me.

1 2 3 4 5

I get worried when I find out my friends are having fun without me.

1 2 3 4 5

I get anxious when I don't know what my friends are up to.

1 2 3 4 5

It is important that I understand my friends "in jokes."

1 2 3 4 5

Sometimes, I wonder if I spend too much time keeping up with what is going on.

1 2 3 4 5

It bothers me when I miss an opportunity to meet up with friends.

1 2 3 4 5

When I have a good time it is important for me to share the details online (e.g. updating status).

1 2 3 4 5

When I miss out on a planned get-together it bothers me.

1 2 3 4 5

When I go on vacation, I continue to keep tabs on what my friends are doing.

1 2 3 4 5

Appendix F. Dispositional Envy scale

Respond to the statements below using the following scale:

1 – Strongly disagree

2 – Moderately disagree

3 – Neither agree nor disagree

4 – Moderately agree

5 – Strongly agree

I feel envy every day.

1 2 3 4 5

The bitter truth is that I generally feel inferior to others.

1 2 3 4 5

Feelings of envy constantly torment me.

1 2 3 4 5

It is so frustrating to see some people succeed so easily.

1 2 3 4 5

No matter what I do, envy always plagues me.

1 2 3 4 5

I am troubled by feelings of inadequacy.

1 2 3 4 5

It somehow doesn't seem fair that some people seem to have all the talent.

1 2 3 4 5

Frankly, the success of my neighbors makes me resent them.

1 2 3 4 5

Appendix G. Facebook Intensity scale

Below is a collection of statements about your feelings toward Facebook. Using the scale provided please indicate how true each statement is of you.

1 – Strongly disagree

2 – Moderately disagree

3 – Neither agree nor disagree

4 – Moderately agree

5 – Strongly agree

Facebook is part of my everyday activity.

1 2 3 4 5

I am proud to tell people I'm on Facebook.

1 2 3 4 5

Facebook has become part of my daily routine.

1 2 3 4 5

I feel out of touch when I haven't logged onto Facebook for a while.

1 2 3 4 5

I feel I am part of the Facebook community.

1 2 3 4 5

I would be sorry if Facebook shut down.

1 2 3 4 5

Approximately how many TOTAL Facebook friends do you have?

1 10 or less,

2 11–50

3 51–100

4 101–150

5 151–200

6 201–250

7 251–300

8 301–350

9 351–400

10 more than 400

In the past week, on average, approximately how much time PER DAY have you spent actively using Facebook?

- 1 0-29min
- 2 30-59 min
- 3 60-89 min
- 4 90-119 min
- 5 120 min or more