Facebook Use and its relationship with Self-esteem, Personalities and Addictive Tendencies.

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Abstract

This thesis will discuss the relationship between Facebook usage and the three variables of personality, self-esteem and addictive tendencies. The aim of this study is to see if certain personalities and levels of self-esteem lead to higher levels of Facebook use. And also to see if Facebook usage has addictive characteristics. This study is being undertaken as it is a neglected topic, the internet and social-networking is a growing virtual world that attracts millions of people, therefore it is important to understand who is more inclined to be on these sites and why. The research method is a quantitative approach, by using a questionnaire to achieve a large sample of responses with factual answers. 188 participants were used, 109 females and 79 males. The analysis revealed that women are more prone to have addictive tendencies towards Facebook. Results indicated a correlation between self-esteem and Facebook use however findings were not significant. Extrovert personalities showed to be most prevalent on Facebook. Facebook has a huge impact on peoples lives as some people go on it to heighten their self-esteem levels, others go onto to feed their personalities, and also people have addictive tendencies towards it now with logging in constantly. Future research needs to be done, with Facebook having such a large audience, there is privacy issues as people display a lot more on their profile than they think.
Introduction

If we don’t exist on Facebook then do we not exist in reality? This certainly seems to be a perception of a large amount of people in today’s society, as the role of social networking remains significantly important in our day-to-day lives. Social-networking is irresistible, we have it on our phones, laptops and most if not all television programmes interconnect with it. The curiosity into other peoples personal and social lives have created a massive social gathering on the World Wide Web. The following will provide an intrinsic overview of how Facebook and Social-Networking has encapsulated the lives of millions.

With the introduction of the internet in the early 1990’s, it has become a worldwide phenomenon. (Streilein, 2000) “World Wide Web was not launched until 1991, yet already over 180 countries are connected and there are over 100 million users in the United states alone”. (Macionis & Plummer, 2005, p134). Anybody around the world can relay information to vast audiences through videos, photos and even personal blogging. These websites offer a gateway for online identity constructions. (Mehdizadeh, 2010)

It is important to note that the ability to use the internet to communicate with a diverse and worldwide audience is not new and cannot be attributed alone to tools such MySpace, Facebook and Twitter. The ability to connect instantly with people from all around the world has been available to us since the creation of forum boards, chat rooms and instant messaging. (Levy, 2010) However, over the past five years Social Networking Sites like Facebook, Myspace and Bebo have become a main focus and virtually unavoidable medium for social interaction. (Gosling, Augustine, Vazire, Holtzman & Gaddis, 2011) The rising popularity of social networks raises many questions
such as; how have these sites become so popular, when did the virtual become more important than reality for some? These questions raise awareness to Social Networking Sites (SNS) and to how important it is to understand their influences.

Social Networking Sites come in all forms, if a person loves taking photos – they go on Flickr, wants to communicate in short bursts of messages – they go on Twitter, loves videos – they go on YouTube. (Levy, 2010) There is a social networking site for just about anything. People develop themselves on these sites and are able to control what other people see. These social networking sites “allow for the management of your online reputation”. (Levy, 2010, p3)

Social-Networking and Privacy

Brandtzaeg, Luders and Skjetne (2010) conducted a study entitled 'Too Many Facebook “Friends”?' which investigates the nature of privacy within Facebook. The research was carried out to see if having large networks of friends can affect the privacy of personal information which is divulged. “Research on Facebook so far has found that individuals share content despite having concerns about privacy”. (Debatin, Lovejoy, Horn & Huges, 2009) According to Bonneau and Preibush (2009) Facebook has adopted a large degree of privacy controls that are designed to co-exist at different levels of sociability and shield the content which is released, however, Bonneau and Preibush (2009) also construct the argument that users are not fully equipped with having a deep knowledge regarding the privacy settings. Livingstone (2008) further notes that young people have a greater ability to cope with privacy settings than older people.

The study of Brandtzaeg, Luders and Skjetne (2010) is of extreme relevance for highlighting issues such as having large multiple social ties of networks of people on Facebook can affect their own personal privacy in relation to social surveillance. The study also highlights that the complexities within the privacy settings has affected the older members of society as it was emphasised in the study that sessions on Facebook that many of the participants in the thirty-three and above bracket share experiences of recalling difficulties with the Facebook privacy settings.
Facebook

Facebook is the most popular of the social networking sites with 800 million active users. There are more than 70 languages available on the site. And now with the influence of smart phones people are logging in when on the go; nowadays you do not need a computer to log in and check your site. Globally 475 mobile phone operators work to deploy and promote Facebook mobile products. Currently there are 350 million active users accessing Facebook through their phone. (Facebook Press, 2012) What is the attraction? Facebook growth has been astonishing, from 2008 to June 2009, Facebook grew 157 percent, gaining an estimated 208 million visitors. (Levy, 2010) When Facebook hit the 200 million active users mark, it made a video about the race to 200 million people and provided the comparison that if it were a country, it would be the world's fifth most populous country, bigger than Japan and Russia. (Levy, 2010)

Facebook users present themselves in an online profile, add 'friends' and can post information or comment to one another's profiles. Facebook also has sections for many different kinds of personal information; religious views, relationship status, political views and favourite music. Users have freedom to post any information or pictures of their choice on their individual profile. (Ellison, Steinfield & Lampe, 2007) This results in a wide range of profiles with some showing more 'private' information than others.

With many people using these sites, displaying information and pictures which can be seen as private to many, employers have started to take advantage of this. Many employers now use social networking sites like a curriculum vitae to determine whether the candidate is suitable for the job. It is evident that a lot more can be told about a person than simply having photos and status's on a social networking site. Are we displaying a lot more on these sites than we think? Copeland (2009)
reports that approximately 12 percent of employers use SNS for this purpose however Kennedy (2008) puts the figure higher at 38 percent.

This indicates that some recruiters make distinctions in job suitability between job candidates whom they perceive to be high and low in the personality trait of conscientiousness. (Sears & Rowe, 2003)

Using the database Academic Search Complete, seminal academic journals were reviewed. As Social Networking is a recent phenomenon there has been little research carried out on this topic therefore there is not a broad spectrum of results but it is hoped that this piece of research can contribute to filling some of the gaps in this very important area. This is most prevalent with regards to addictive tendencies and social-networking in relation to both areas having a strong correlation with each other. To follow an insight into personality characteristics and self-esteem characteristics of Facebook users as perceived by academics and journal articles.

**Personality Characteristics of Facebook Users**

Parikh and Gupta (2010) cited Funder (2001) in their book to define the meaning of personality traits, they concurred that “an individual\’s characteristic pattern of thought, emotion, and behaviour, together with the psychological mechanisms – hidden or not – behind those patterns”. (Parikn & Gupta, 2010, p187) In simple terms, personality is what makes a person different or similar to others. Many researchers have used the Neo-Five Factor Inventory by Costa and Mc Crae to measure the different personality traits. The ones which are recognised in the Costa and Mc Crae model are extroversion (amount and intensity of interpersonal interactions), neuroticism (degree of emotional adjustment and instability), openness to experience (pursuing and appreciating all types of experience), conscientiousness (control, regulation and direction of goals and impulses) and agreeableness (the type of interactions a person prefers to have with others). (Costa & Widiger, 2002)
In the study by Wilson, Fornaiser and White (2010), 'Psychological Predictors of Young Adults' Use of Social Networking Sites', they aimed to test the role of personality and self-esteem in the context of young adults and their levels of Social Networking Use. Also to investigate whether these intrapersonal characteristics predict young adults' addictive tendencies toward the use of SNSs(Wilson et al, 2010) They did this with the Neo-Five Inventory (Costa & McCrae, 1992), the Coopersmith Self-Esteem Inventory (Coopersmith, 1981), Addictive tendencies scale (Walsh, White & Young, 2007; Ehrenberg, Juckes & White, 2008) and also Facebook related questions such as time spent on Facebook and how many friends the user had on their profile. There participants were students in an Australian university and 201 participants took part.

There findings showed that extroverted people reported higher levels of Facebook use and addictive tendencies. (Wilson et al, 2010) These results show that extroverts need unlimited contact with the virtual world and 'friends' for a high stimulation and a large social network. It also showed participants who scored low on conscientious spent an increased amount of time on Facebook, this is thought to be down to the fact that instead of study they are procrastinating on Facebook. The openness trait had no influence on SNS use and this is thought so because social networks are no longer a 'new' creation. Agreeableness and neuroticism were found to have no impact on Facebook use. (Wilson et al, 2010)

In the study by Amichai-Hamburger and Vinitzky (2010), they found a significant correlation between personality and Facebook use. They found that extroverts positively correlated with the number of Facebook friends the user has and that “people with low or high levels of neuroticism were inclined to share more basic information than people with moderate levels of neuroticism”. (Amichai-Hamburger et al, 2010) Furthermore to this they discovered that users with greater openness to experience used more features from the personal information section than users with lower levels of openness to experience.
Traits associated with 'extraversion' include sociability, assertiveness, talkativeness and being active. Those high in extraversion tend to show a preference for interpersonal interaction and social activity. (Borman & Motowidlo, 1993) In the study by Davies, French and Keogh (1998) they found extraversion to positively correlate to self-deceptive enhancement which is “having an inflated, yet honestly held Self-description”. (Davies et al, 1998) Findings by Kristof-Brown, Barrick and Franke (2002) showed that extraverted individuals make greater use of self promotion. This links back to Wilson et al (2010) findings that extravert personalities have a significant positive correlation with Facebook use, extroverts use Facebook as an outlet for self-promotion.

A number of studies show that there is no relationship between neuroticism and self-presentation. For example, Hill (2004) and Davies et al (1998) found no significant relationship between neuroticism and impression management. In contrast to these findings, Marcus, Machilek and Schutz (2006) found a significant negative correlation between neuroticism and self-monitoring, meaning that those “higher in neuroticism demonstrate a lack of ability in modifying their behaviour to gain the social approval of others”. (Marcus et al, 2006)

In Kristof-Brown et al study (2002) they found that those high in agreeableness demonstrated self-presentation through self-promotion, for example writing more in the 'Bio' section on social networking sites. Vazire and Gosling (2004) found a strong correlation in their study between agreeableness and impression management. These findings do not link in with Wilson et al's study (2010) which found no relationship between agreeableness and social networking use. Landers and Lounsbury (2004) found a negative correlation between agreeableness and social networking use, meaning that disagreeable people spend more time on the internet.

Marcus et al (2006) found that conscientiousness was positively correlated to self-monitoring and presentation, this shows that those high in conscientiousness engage on social-
networking sites to get social approval. This is in contrast to Wilson et al's (2010) research which stated that those scoring low on conscientiousness were found to spend more time on SNS's.

With regards to 'openness to experience' and social networking sites, Ross, Orr, Sisica, Areneault, Simmering and Orr (2009) found that those higher in levels of openness to experience had been associated with greater online sociability. This is in contrast to Wilson et al's (2010) findings that openness had no influence on social networking use.

Self-Esteem characteristics of Facebook Users

Self-esteem is defined in Wilson et al study (2010) as being “the subjective evaluation a person makes and maintains about himself or herself and the extent of belief in their capability, worth, and significance, which is conveyed through their attitudes and verbal behaviour”. (Wilson et al, 2010 p 1) Wilson et al found (2010) no link between self-esteem and SNS use.

In the study by Valkenburg, Peter and Schouten (2006), they found that Facebook can enhance 'social self-esteem', measures as perceptions of a user's physical appearance and close relationship, this is especially evident when 'Facebook friends' give positive feedback. Ellison et al (2007) also found that users of Facebook with low-self-esteem may seek the social opportunities created on Facebook which creates positive benefits for one's self-esteem. This leads on to the idea that people who spend longer online have lower self-esteem and are trying to build a social connection with other users to improve self-esteem levels. This links in to Mehdizadeh's study (2010).

In Soraya Mehdizadeh's study (2010) 'Self-Presentation 2.0: Narcissism and Self-Esteem on Facebook' they found a negative correlation between self-esteem and Facebook use. Participants who rated lower on the Rosenberg Self-Esteem Scale (Rosenberg,1965) had a correlation with a greater amount of time spent of Facebook per session and a greater number of Facebook logins per
day. Some research believes that Facebook use is motivated by two needs, the need to belong and the need for self-presentation. “*These sites offer a highly controlled environment for self-presentational behaviour, which provides an ideal setting for impression management.*” (Mehdizadeh, 2010) Individuals who struggle to make social connections in face-to-face interactions will use the internet as a place to enhance their interpersonal lives by forging social relationships online. (Gosling et al, 2011) This outcome can be seen as people with low self-esteem try to create there perfect 'real' world online, where self-presentation can be controlled.

In Manago, Taylor and Greenfields study (2012), they based their aim on Greenfield's (2009) theory of social change which sees technology being the driving force in individualism which sees performing for an audience as inflating self-esteem. Because many people have a large number of friends on Facebook , this facilitates performing for an audience, therefore the study predicted a positive correlation between self-esteem and audience size. Their findings showed a significant positive correlation between estimates of audience size and self-esteem. Larger audiences were associated with higher self-esteem.

Kalpidou, Costin and Morris (2011) examines how Facebook use and attitudes toward Facebook related not only to their self-esteem but to variables that measure social, emotional and academic adjustment to college, as well as attachment to the institution. They aimed to find a negative correlation between Facebook use and self-esteem. Participants included 70 undergraduate college students (67 per cent were female), using the Rosenberg Self Esteem Scale that found a negative correlation between minutes on Facebook and self esteem, this suggests that spending a lot of time on Facebook is associated with low self-esteem. (Kalpidou et al, 2011) Ellison et al (2007) found that students with low-self esteem benefit from using Facebook because they expand their social capital (Ellison et al, 2007) Kalpidou et al's findings indirectly supports this interpretation.

In Gonzales and Hancocks study (2011) they found that Facebook has a positive effect on self-esteem. Sixty-three participants took part in their study, each participant sat in front of a computer that was either turned off or had the student's Facebook profile. Some of the computers that were off had a mirror beside them while others had no mirror. Participants were told that they
had three minutes to look through any of the tabs on their profile page. When the three minutes were up each participants were given the Rosenberg Self Esteem Scale (1965). The results showed that the participants who were looking at the mirror showed no elevations in self-esteem. However, the participants who used Facebook showed higher ratings of self-esteem. This shows that being on Facebook boosts self-esteem. The highest reports of self-esteem came from the participants who edited their Facebook profile during the three minutes. This indicates that our ability to select how we present ourselves to others is very important for self-esteem Their study suggests that “self-presentation can have a positive influence on self-esteem”. (Gonzales et al, 2011, p81) This relates back to Mehdizadeh's (2010) study, which states that people with low self-esteem will be more eager to engage in online activities that may rise their self-esteem.

Addictive characteristics/Tendencies of Facebook Users

In a study by scientists in MIT Massachusetts, IULM University in Milan and two laboratories in Italy, they discovered that people displayed physical and psychophysiological responses while using Facebook similar to those exhibited by people while playing a musical instrument or engaging in other creative activities. Further to just using Facebook for obvious reasons for social networking, people may actually be seeking out the chemical responses they experience while browsing social networks. (Epstein, 2012)

Newspaper stories have reported the potential addictive qualities of social networking site. Such coverage has alleged that women are at greater risk then men for developing addictions to Social Networking Sites. (Revoir, 2008) The addictive powers of social networking sites are a growing concern, Young (1999) states that there are five different types of internet addiction; computer addiction (online games), information overload (web surfing addiction), net compulsions
(gambling and shopping online), cybersexual addiction (online pornography) and cyber-relationship addiction. Evidently Social-Networking Sites fall in to the last category of cyber-relationship addiction as the main idea for Social-Networking is to maintain and create relationships. (Young, 1999) Boyd and Ellison (2008) discuss in the research that social networking sites are egocentric sites, it is the individual who is the main focus on these sites rather than the site itself. This links in with self-presentation which is a main factor with self-esteem and personalities. In Li’s (2010) study 'Exploration of adolescents' Internet addiction', he found that egocentrism to be linked to internet addictions. The egocentric construction of Social-Networking Sites can facilitate the engagement of addictive behaviours and therefore serves as a factor that gets people using the sites in an excessive way. (Li, 2010)

The Telegraph discusses how Facebook to blame for 'friendship addiction' and fuelling insecurity in users according to psychologists. This can be related to self-esteem. Woman are seen to be more vulnerable to friendship addiction as self-worth stems from gaining hundreds of friends. “David Smallwood, an addictions expert with the Priory clinic said that the site was unsuitable for people recovering from drug, alcohol and shopping addictions and could increase feelings of rejection through the friend 'request' function.” (The Telegraph, 2008, p 14)

Researchers have suggested that the excessive use of new technologies, such as the computer and social networking sites may be particularly addictive to young people. (Echeburua & de Corral, 2010) To date there has been little research carried out that has specifically dealt with and assessed the addictive potential of SNS's. (Wilson et al, 2010; Karaiskos, Tzavellas, Balta & Paparrigopoulos, 2010)

In Wilson et al study (2010), 201 college students (153 females and 46 males, with an average age of 19 years) used the addictive tendencies scale which included three items measuring salience, loss of control and withdrawal . They used multiple regression analysis that showed high extraversion and low conscientiousness scores significantly predicted both addictive tendencies and the time spent using an SNS. Wilson et al (2010) discussed that the relationship between
extraversion and addictive tendencies could be explained by the fact that using SNS's satisfies the extraverts' needs to socialise. (Wilson et al, 2010) The findings with regards to lack of conscientiousness are on the same wave length as previous research on the frequency of general internet use in that people who score low on conscientiousness tend to use the internet more frequently than those who score high on this personality trait. (Lander & Lounsbury, 2004)

In Karaiskos et al (2010) study, they report on a 24 year old female who used Social-Networking Sites to such an extent that her behaviour damaged her professional and private life. Therefore she was referred to a psychiatric clinic. The woman used Facebook for at least five hours a day, and was let go from her job as she repeatedly checked Facebook instead of working. Karaiskos et al discuss (2010) that even in her clinical interview, she used her smart-phone to access Facebook. Not only did the woman lose her job due to her addiction to Facebook but she also developed anxiety symptoms as well as insomnia. This further backs up Echeburua et al (2010) suggestion that young people are at risk of developing addictions to social networking sites.

Aims of the Presents Study

The present research aims to see if certain personalities and levels of self-esteem lead to higher levels of Facebook use. And also to see if Facebook usage has addictive characteristics. The research will also investigate gender difference on Facebook and see which gender is more prevalent on Facebook.
Hypothesise

Self-Esteem

Hypothesis One: There will be a significant negative correlation between self-esteem and the length of time spent on Facebook.

Hypothesis Two: There will be a significant negative correlation between self-esteem and how often participants log on to Facebook.

Personality

Hypothesis Three: There will be a significant negative relationship between the conscientiousness personality and how often the participants log onto Facebook.

Hypothesis Four: There will be a significant positive relationship between the extrovert personality and how often the participants log in to Facebook.

Hypothesis Five: There will be a significant negative relationship between the neurotic personality and how often the participants log in to Facebook.

Hypothesis Six: There will be a significant negative relationship between the openness personality and how often the participants log in to Facebook.

Hypothesis Seven: There will be a significant negative relationship between the agreeableness
personality and how often the participants log in to Facebook.

Addictive Tendencies

**Hypothesis Eight:** There will be a significant negative correlation between addictive tendencies and how many friends participants have on Facebook.

**Hypothesis Nine:** There will be a significant negative correlation between addictive tendencies and how often participants log in to Facebook.

**Hypothesis Ten:** There will be a significant negative correlation between addictive tendencies and how often participants change their profile picture.

**Hypothesis Eleven:** There will be a significant negative correlation between addictive tendencies and how long participants spend on Facebook on each log in.
Methodology

Design

The design of this research project was a non experimental quantitative design using correlation. “Correlations study is used to discover or establish the existence of a relationship between two or more aspects of a situation.” (Kumar, 2005, p10) Correlation is been used as the aim of the research is to find a relationship between the variables, Facebook use, personality, self-esteem and addictive tendencies. There are three possible results of a correlation study, a positive correlation, a negative correlation and no correlation. Frequency and percentages were used to show the Facebook usage responses. Descriptive statistics were used to analyse differences and similarities between gender and each of the variables. The independent variable was gender while the dependent variables were Facebook use, self-esteem, personality and addictive tendencies. Inferential statistics were used for correlation to show the relationship between the variables.

Participants

A total of 188 (109 females and 79 males) from the Leinster region of Ireland were recruited for this study. Inclusion criteria required participants to be over eighteen and have a Facebook profile. Ages ranged from eighteen to sixty-two, however the average age was twenty-four of the participants.

Materials
All participants completed a short booklet of questionnaires containing The Bipolar Big Five markers (Shafer, 1999), Rosenberg’s Self-Esteem Scale (Rosenberg, 1965) and the Addictive Tendencies Scale (Walsh et al, 2007; Ehrenberg et al, 2008), as well as questions about gender and age and Facebook use.

1. Facebook use: Questions were constructed by the researcher concerning how often the participant spent on Facebook and how many friends the participant had on their profile.

2. Self-esteem was assessed by The Self-Esteem Scale (Rosenberg, 1965), which measures global feelings of self-worth or self-acceptance. This 10-item scale is scored using a 4-point response format (1 = strongly agree; 4 = strongly disagree) to statements such as “I feel that I have a number of good qualities”. Scores range from 10-40, with higher scores indicating higher self-esteem.

3. Personality was measured by The Bipolar Big Five markers (Shafer, 1999) are a brief set of 30 rating scales designed to measure the Big Five personality traits. There are five pairs of bipolar trait terms rated on a 7-point scale. Respondents are required to circle a number from 1 to 7 indicating which word best describes them (1 = very much like the word on the left; 7 = very much like the word on the right).

(a) **Conscientiousness.** The Conscientiousness Scale contains six pairs of adjectives e.g. ‘Lazy’ – ‘Hardworking’. Scores range from 6 to 42 with higher scores indicating more conscientiousness.

(b) **Agreeableness.** The Agreeableness Scale contains six pairs of adjectives e.g. ‘Gentle’ – ‘Headstrong’. Scores range from 6 to 42 with higher scores indicating more agreeableness.

(c) **Openness to experience.** The Openness to experience Scale contains six pairs of adjectives e.g.
‘Original’ – ‘Conventional’. Scores range from 6 to 42 with higher scores indicating more openness.

(d) **Extraversion.** The Extraversion Scale contains six pairs of adjectives e.g. ‘Quiet’ – ‘Talkative’. Scores range from 6 to 42 with higher scores indicating more extraversion.

(e) **Neuroticism.** The Neuroticism Scale contains six pairs of adjectives e.g. ‘Anxious’ – ‘Calm’. Scores range from 6 to 42 with higher scores indicating more Neuroticism.

4. Addictive tendencies scale. Based on previous research, the addictive tendencies scale (Walsh et al, 2007; Ehrenberg et al, 2008) comprised three items measuring level of salience (“One of the first things I do each morning is log onto a social networking Internet site [e.g. Facebook]”), loss of control (“I find it hard to control my use of a social networking site [e.g. Facebook]”), and withdrawal (I feel lost when I cannot access my social networking site [e.g. Facebook]).

**Procedure**

Once participants were determined, the questionnaire was put together and produced on 'Google Documents' and distributed online on Facebook, in the Leinster region of Ireland for approximately four weeks. Participants were made aware of ethical concerns and were assured of confidentiality at all times. Participants were also assured that all their answers would remain strictly anonymous and also that they had the right to withdraw from participation at any time. Any participants who took part in the study who were under eighteen were deleted from the research for ethical reasons. The Statistical Package for the Social Sciences, (SPSS) 18 software, was used to analyse the data and test the relationships for the hypothesis.
Results

All statistics were computed with SPSS 18 for Windows.

Frequencies and percentages

All participants were asked a series of questions relating to Facebook usage. The frequencies and percentages of the responses to these questions are listed in the following tables below.

**Question one:** How many friends do you have on Facebook?

**Table 1: Number and percentage of Participant’s responses to Question: How many friends do you have on Facebook?**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 100</td>
<td>8</td>
</tr>
<tr>
<td>between 101 and 300</td>
<td>68</td>
</tr>
<tr>
<td>between 301 and 500</td>
<td>55</td>
</tr>
<tr>
<td>between 501 and 700</td>
<td>28</td>
</tr>
<tr>
<td>over 701</td>
<td>29</td>
</tr>
<tr>
<td>Total</td>
<td>188</td>
</tr>
</tbody>
</table>

As can be seen from table one above, 36% of people had on average between 101 and 300 friends. And also just over 15% had over 701 friends.

**Question Two:** How often do you change your profile picture?

**Table 2: Number and percentage of Participant’s responses to Question: How often do you change your profile picture?**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>once a day</td>
<td>2</td>
</tr>
<tr>
<td>couple of times a week</td>
<td>7</td>
</tr>
<tr>
<td>once a week</td>
<td>6</td>
</tr>
<tr>
<td>couple of times a month</td>
<td>65</td>
</tr>
<tr>
<td>rarely</td>
<td>108</td>
</tr>
<tr>
<td>Total</td>
<td>188</td>
</tr>
</tbody>
</table>

As can be seen from above table two above, more than half of participants (57.4%) rarely change their profile picture. Whereas just over one third change their profile picture a couple of times a
As can be seen from table three above, 42% of participants had somebody else in their photo with them. Just under 6% had other, in their profile picture which could have been a pet or animal.

**Question Four:** How long do you spend on Facebook on each log in?

As can be seen from table four above, more than half of participants only spent less than 30 minutes on each log in. Whereas just over 9 percent spent over two hours on each log in.

**Question Five:** How often do you log in to Facebook?

As can be seen from table five above, more than half of participants only spent less than 30 minutes on each log in. Whereas just over 9 percent spent over two hours on each log in.
once a week | 2 | 1.1
rarely | 4 | 2.1
Total | 188 | 100.0

As can be seen from table five above, 77% of participants log in to Facebook a few times a day. Whereas only 1.1% of participants log in only once a week.

**Question six:** Do you have Facebook on your mobile?

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
<td>152</td>
</tr>
<tr>
<td>no</td>
<td>36</td>
</tr>
<tr>
<td>Total</td>
<td>188</td>
</tr>
</tbody>
</table>

As can be seen from table six above, the majority of participants (80.9%) had Facebook on their phone.

**Descriptive statistics**

The following tables (seven, eight and nine) list the means and standard deviations for the variables used in the analysis.

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male Total Self Esteem Score</td>
<td>79</td>
<td>24.00</td>
<td>40.00</td>
<td>31.7342</td>
<td>4.32852</td>
</tr>
<tr>
<td>Female Total Self Esteem Score</td>
<td>109</td>
<td>16.00</td>
<td>40.00</td>
<td>30.4312</td>
<td>4.46875</td>
</tr>
</tbody>
</table>

As can be seen from table seven above, males have a higher self-esteem score (mean = 31.73, SD = 4.33) than females (mean = 30.43, SD = 4.47). Also the minimum self-esteem level in males is 24 while it is lower in females with 16.
Table 8: Means and Standard Deviations for Personality Scores for males and females.

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Extraversion total</td>
<td>76</td>
<td>17.00</td>
<td>30.00</td>
<td>22.7895</td>
<td>2.47287</td>
</tr>
<tr>
<td>Neuroticism total</td>
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<td>16.00</td>
<td>29.00</td>
<td>23.3553</td>
<td>2.70162</td>
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<tr>
<td>Conscientiousness total</td>
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<td>19.00</td>
<td>34.00</td>
<td>24.3553</td>
<td>2.72619</td>
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<td>17.00</td>
<td>36.00</td>
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<td>3.66965</td>
</tr>
<tr>
<td>Openness total</td>
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<td>14.00</td>
<td>31.00</td>
<td>22.8684</td>
<td>3.41894</td>
</tr>
<tr>
<td>Valid N (listwise)</td>
<td>62</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Female</td>
<td></td>
<td></td>
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<tr>
<td>Extraversion total</td>
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<td>15.00</td>
<td>36.00</td>
<td>23.2157</td>
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<tr>
<td>Neuroticism total</td>
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<tr>
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<td>36.00</td>
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<td>17.00</td>
<td>36.00</td>
<td>24.8020</td>
<td>3.50719</td>
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<td>Openness total</td>
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<td>12.00</td>
<td>42.00</td>
<td>22.3627</td>
<td>4.12860</td>
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<td>Valid N (listwise)</td>
<td>85</td>
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</table>

As can be seen from table eight above, males scored lower on the personality traits Extraversion, Neuroticism and Agreeableness than females whereas, males generally scored higher for the personality traits Conscientiousness and Openness than females.

Table 9: Mean and Standard Deviation for Addictive Tendencies scores for males and females

<table>
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<tr>
<th>Gender</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
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</thead>
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<tr>
<td>Male</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total addictive tendencies</td>
<td>79</td>
<td>3.00</td>
<td>6.00</td>
<td>4.6835</td>
<td>1.13842</td>
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<tr>
<td>Valid N (listwise)</td>
<td>79</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Female</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total addictive tendencies</td>
<td>109</td>
<td>3.00</td>
<td>6.00</td>
<td>4.5413</td>
<td>1.07611</td>
</tr>
<tr>
<td>Valid N (listwise)</td>
<td>109</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As can be seen from table nine above, females have a lower mean and standard deviation (mean=4.5413, SD=1.076) in comparison to males (mean=4.6835, SD=1.138), which shows females have more of an addictive tendency.
Inferential statistics

Correlations

Self-Esteem

**Hypothesis one** predicted that there will be a significant negative correlation between self-esteem and length of time spent on Facebook. Correlational analyses indicated a negative relationship between time spent on Facebook and self-esteem, however this relationship was not significant for males $r = -.052$, $N=79$, $p>.05$ and for females $r = -.031$, $N=109$, $p>.05$. Therefore hypothesis one was not accepted.

**Hypothesis two** predicted that there will be a significant negative correlation between self-esteem and how often participants log onto Facebook. Correlational analyses indicated a negative relationship between how often participants log onto Facebook and self-esteem, however this relationship was not significant for males $r = -.125$, $N=79$, $p>.05$ and for females $r = -.052$, $N=109$, $p>.05$. Therefore hypothesis two was not accepted.

**Personality**

**Hypothesis three** predicted a significant negative relationship between the conscientiousness personality and how often the participants log in to Facebook. Correlational analysis indicated a negative relationship between conscientiousness personality and how often each participant logs in to Facebook, however this relationship was not significant for males $r = -.049$, $N=76$, $p>.05$ and for females $r = -.061$, $N=104$, $p>.05$. Therefore hypothesis three was not accepted.
Hypothesis four predicted a significant positive relationship between the extrovert personality and how often the participants log in to Facebook. Correlational analysis indicated a positive relationship between extroversion personality and how often each participant logs in to Facebook, this was not significant for males $r = .112$, $N= 76$, $p>.05$. However it is significant for females $r= .234$, $N= 102$, $p<.05$. Hypothesis four partially was accepted.

Hypothesis five predicted a significant negative relationship between the neuroticism personality and how often the participants log in to Facebook. Correlational analysis indicated a negative relationship between neuroticism personality and how often the participants log in to Facebook for males yet it is not significant $r= -.013$, $N= 76$, $p>.05$ Correlational analysis indicated a positive relationship between neuroticism personality and how often the participants log in to Facebook for females, however this was not significant $r= .035$, $N= 105$, $p=>.05$. Therefore hypothesis five was not accepted.

Hypothesis six predicted a significant negative relationship between the openness personality and how often the participants log in to Facebook. Correlational analysis indicated a positive relationship between the openness personality and how often the participants log in to Facebook, however this was not significant for males $r= .019$, $N= 76$, $p>.05$ or females $r = .078$, $N= 102$, $p>.05$. Therefore hypothesis six was not accepted.

Hypothesis seven predicted a significant negative relationship between the agreeableness personality and how often the participants log in to Facebook. Correlational analysis indicated a negative relationship between the agreeableness personality and how often the participants log in to Facebook, however this was not significant for males $r= -.048$, $N=74$, $p>.05$ or for females $r= -.085$,
Addictive Tendencies

Hypothesis eight predicted a significant negative correlation between addictive tendencies and how many friends participants have on Facebook. Correlational analysis indicates that there is a negative relationship between how many friends participants have on Facebook and addictive tendencies, however this was not significant with males $r = -.118$, $N=79, p>.05$ whereas with females $r = -.311$, $N= 109, p<.01$ it was highly significant. Therefore the hypothesis was partially accepted.

Hypothesis nine predicted a significant negative correlation between addictive tendencies and how often participants log in to Facebook. Correlational analysis indicates a positive relationship between how often participants log in to Facebook and addictive tendencies, however males were not significant $r=.168$, $N=79, p>.05$, females were significant $r = .240$, $N= 109, p<.05$. Therefore the hypothesis was partially accepted.

Hypothesis ten predicted a significant negative correlation between addictive tendencies and how often participants change their profile picture. Correlational analysis indicates a positive relationship between how often participants change their profile picture and addictive tendencies, this was highly significant with males $r = .387$, $N= 79, p<.01$ however it was not significant with females $r= .136$, $N= 109, p>.05$. Therefore the hypothesis was partially accepted.

Hypothesis eleven predicted a significant negative correlation between addictive tendencies and how long participants spend on Facebook on each log in. Correlational analysis indicates a negative
relationship between how long participants spend on Facebook and addictive tendencies, this was not significant with males $r = -0.207$, $N=79, p>.05$, however, it was highly significant with females $r = -0.446$, $N=109, p<.01$. Therefore hypothesis was partially accepted.
Discussion

The aim of this study was to see if certain personalities use Facebook more than others, to see if there is a link between self-esteem and Facebook usage and to also see if there is a link between addictive tendencies and Facebook usage.

Self-Esteem

One of the predictions of this study was that there is a negative correlation between self-esteem and the length of time spent on Facebook. The results indicated a negative correlation yet this was not significant for males or females. These findings support Mehdizadeh’s (2010) findings that there is a negative correlation between self-esteem and time spent on Facebook. These findings are also in line with Kalpidou et al (2011) study in which they found a negative relationship between minutes on Facebook and self-esteem. This suggests that spending a lot of time on Facebook is associated with low self-esteem. This is in contrast to research by Gonzales and Hancock (2011) which found spending time on Facebook boosts self-esteem measures. The results do however interlink with Gonzales et al study which stated that self-presentation is linked to Facebook use. It can be said that those with low self-esteem are taking their time posting information about themselves to boost 'social self-esteem', therefore spending longer online than those with higher self-esteem. However since the results in this study was not significant hypothesis one was not accepted.
Hypothesis two aimed to find a negative correlation between self-esteem and how often participants log onto Facebook. The results indicated a negative correlation yet this was not significant for males or females. These findings are in line with Mehdizadeh's (2010) study in which she found that those who rated lower on the Rosenberg Self-Esteem Scale (Rosenberg, 1965) had a greater number of logins per day. This again suggests that logging in to Facebook more often is associated with low self-esteem. Facebook has already been noted to maintain social connections and relationships. Ellison et al (2007) found that Facebook use was related to bridging, bonding and maintaining social capital, so it can be said that those with low self-esteem log in more often to maintain relationships and boost 'social self-esteem'. However since the results were not significant in this study the hypothesis was not accepted.

Overall, in the present study self-esteem was found to be relatively high amongst participants. However even though the results were not significant there was still a correlation found between self-esteem and Facebook usage, this is in contrast to Wilson et al's study (2010) where their results indicated no link between self-esteem and social networking sites. Academic supporters of these findings were Mehdizadeh (2010), Wilson et al (2010), Ellison et al (2007), Kalpidou et al (2011) and Gonzales et al (2011) all of whom expressed shared and contrasting views on the subject matter were imperative to the study so the researcher could obtain a general overview of this important area. Although the five studies shared equal value in the study, Mehdizadeh's (2010) study was of most significance as it correlated with the key findings in the research.

**Personalities**

Hypothesis three aimed to find a negative relationship between the conscientiousness personality trait and how often participants log in to Facebook. Results indicated a negative
relationship between conscientiousness and Facebook use, however this was not significant for males or females. These findings are in line with Wilson et al (2010) study where it was found that those who scored low on conscientiousness spent an increased amount of time on Facebook. These findings are in contrast to Marcus et al (2006) findings, they found that conscientiousness was positively correlated to self-monitoring and presentation, meaning that those high in conscientiousness engage on social-networking sites to get social approval. However since the findings in this study were not significant the hypothesis was not accepted.

Hypothesis four aimed to find a positive relationship between the extrovert personality and how often participants log in to Facebook. Results indicated a positive relationship between extraversion personality and how often each participant logs in to Facebook, this was not significant for males however it was significant for females. These findings correspond with Wilson et al (2010) results, which showed extroverted people reported higher levels of Facebook use. These results show that extroverts need unlimited contact with the virtual world and a large social network. This shows the they need a large network of people around them to feel confident and secure and in other ways use the social networking sites as a method of promoting reassurance in their lives. With this current study, extroverted girls log in to Facebook more often than extroverted boys. These results also correspond with Barrick and Franke (2002) results which showed extraverted individuals make greater use of self-promotion. Relating back to Bormand et al (1993) who discussed extraversion traits including sociability, talkativeness and being active, these traits are displayed online on these social-networking sites as a form of interaction and social activity. Extroverts use Facebook as an outlet for self-promotion, therefore log in to Facebook more frequently than others. Hypothesis was partially accepted in this case.

Hypothesis five aimed to find a negative relationship between the neuroticism personality
and how often the participants log in to Facebook. Results indicated a negative relationship between the neuroticism personality and how often the participants log in to Facebook for males, however, this was not significant. Results indicated a positive relationship between the neuroticism personality and the how often the participants log in to Facebook for females, however this was not significant either. These are similar and contrasting to Marcus et al (2006) findings, which indicated a significant negative correlation between neuroticism and self-monitoring. Marcus et al (2006) discussed that these results indicated that those higher in neuroticism show a lack of ability in changing their behaviour to gain social approval from others. These finding are in line with males in this study, however, findings were not significant therefore the hypothesis was not accepted. With regards to females having a positive relationship, this indicates that females find it easier to change their behaviour for social approval. The male findings correspond with Wilson et al (2010) results which found that neuroticism has no impact on Facebook use, however, because the results were not significant this can not be proven.

Hypothesis six aimed to show a negative relationship between the openness personality and how often the participants of the study log in to Facebook. Results indicated a positive relationship between the openness personality trait and how often the participants log in to Facebook, how ever this was not significant for males or females. These findings are in contrast to Ross et al (2009) study which found that those higher in levels of openness to experiences had been associated with greater online sociability. The results are also in contrast to Wilson et al (2010) study which found the openness trait to have no influence on social networking sites, Wilson et al (2010) believed this was down to social networks no longer being a 'new' creation, therefore the openness participants had no interest no longer. Present findings found a positive relationship, even though it was not significant, the openness theory gives a sense of new concepts and freshness which are dimensions that people are constantly striving for. Although Facebook has not been on the market too long it is
constantly changing and adapting its layout to keep the general public interested. This is a necessity for the company because other social networking sites have been cast away in the shadows due to a failure of alternating ideas and public interests. The hypothesis was not accepted.

Hypothesis seven aimed to find a negative relationship between the agreeableness personality and how often the participants log in to Facebook. Results indicate a negative relationship between the agreeableness personality and how often the participants log in to Facebook, however this was not significant for males or females. This is in line with Wilson et al (2010) results which found that the agreeableness personality trait had no impact on Facebook use. These results also correspond with Landers and Lounsbury (2004) which found a negative correlation between agreeableness and social networking use, meaning that disagreeable people spend more time on social networking sites.

Evidence has suggested in the study, that personalities have an influence on Facebook use. The extrovert personality was the main personality to have an influence on Facebook use. This is in line with previous research carried out. However this was solely with females, as males were not significant. Other findings included males scoring lower on neuroticism and agreeableness than females while males scored lower on conscientiousness and openness than females. It is evident that personalities have a huge influence on Facebook usage. It is also important to note how social networks, especially Facebook are constantly changing to try and keep all personalities involved, this may be the reason as to why Facebook is the most popular site with 800 million users. (Facebook Press, 2012)

Addictive Tendencies
Hypothesis eight aimed to find a negative correlation between addictive tendencies and how many friends participants have on Facebook. Results indicated a negative relationship between how many friends participants have on Facebook and addictive tendencies, this was not significant for males yet it was highly significant for females. The more negative the correlation the more addictive tendencies the participant has. These results correspond to research carried out by David Smallwood from the Priory clinic that states that women are more vulnerable to friendship addiction as self-worth stems from gaining hundreds of friends therefore women can become obsessed with making and maintaining 'friendships' online to boost self-esteem and social approval. The hypothesis was partially accepted.

Hypothesis nine aimed to find a negative correlation between addictive tendencies and how often participants log in to Facebook. Results indicate a positive relationship between how often participants log in to Facebook and addictive tendencies, however males were not significant whereas females were significant. This indicates that females who log in more to Facebook tend to be less addicted to Facebook. This is a surprising result, but linked with the result of hypothesis eleven, it can be said that those who log in less are more addicted to Facebook as they spend longer on each log in. Hypothesis was not accepted.

Hypothesis ten aimed to find a negative correlation between addictive tendencies and how often participants change their profile picture. Results indicate a positive relationship between how often participants change their profile picture and addictive tendencies, this was highly significant for males, however it was not significant for females. This research shows that males that change their profile picture less have less addictive tendencies. This hypothesis was not accepted.
Hypothesis eleven aimed to find a negative correlation between addictive tendencies and how long participants spend on each log in. Results indicate a negative relationship between how long participants spend on Facebook and addictive tendencies. This was not significant for males, however it was highly significant for females. These results show the longer a participant spends on each log in on Facebook the more addictive tendencies the participant has towards Facebook, this is only significant with females. These results show the longer a participant spends on each log in on Facebook the more addictive tendencies the participant has towards Facebook, this is only significant with females. This relates back to Revoir's theory (2008) that states women are at a greater risk of developing addictive tendencies than men therefore log in more frequently.

From the research found it is evident that there is a link between Facebook usage and addictive tendencies. This is an important area which needs to be further studied especially with the growing amount of users attracted to using Facebook. And also with how it was found that women are more addicted to using Facebook than men. It is important to note Social Networking as an addiction as people get lost in the virtual world and lose all sense of reality this can be seen in Karaiskos et al (2010) study in which they reported a female becoming 'addicted' to Facebook which affected her personal and professional life, who was then referred to a psychiatric clinic.
Limitations

Although the researcher was able to have direct access to a representative sample there was a number of limitations discovered within the process.

One of the limitations that was identified in the study was the unequal amount of participants in relation to gender. There were more female participants in the study and this may have hindered results. Future research may use a more balanced gender ratio.

Another limitation was the sample size, these results are only a guideline and not a world-wide indicator to show personalities link with Facebook, addictive tendencies and Facebook and also self-esteem. Research in this area is very much in the budding stages so more detailed uncovering is essential for future findings.

A boundary which also presented itself in the study was the participants uncertainty in disclosing personal information regarding self-esteem traits, in this study self-esteem levels were relatively high which gives the impression that participants thought the researcher might have access to individual results even though they were told it was confidential. Having the questionnaire online was a fast way of collecting data yet doing this may have hindered results.

Finally it can also be argued that in this study is the mere assessment of addiction tendencies, which does not suffice to distinguish real pathology. It needs to be ensured that rather than assessing excessive use and preoccupation, addiction specifically needs to be assessed also. This study suffered from only endorsing three potential addiction criteria which is not sufficient for establishing addiction status clinically to social-networking.
Conclusion

The researcher hopes that the findings unveiled in this study have contributed to the complex discussion of personalities, self-esteem and addictive tendencies influence on social networking sites. Areas which materialised from the literature review were instrumental in the findings of the researcher. By applying the quantitative method of a questionnaire a congruent picture was uncovered to emphasise the role and implications social networking has on peoples lives.

Overall it is clear that results of the present study show that the higher the Facebook usage the more addictive tendencies the user has towards it. Present findings have reiterated other research in saying that women are more addicted to social networking than males. Gaps still remain in this area with more research required to give a wider more detailed picture.

The concept of privacy and social networking was a topic discussed earlier in the literature review however it did not present itself as a relevant theme amongst participants. The researcher feels that this is an important area that needs to be addressed especially since so many people use social networking sites; amount of young people who use the service and privacy related to the occupational industry. Personality and self esteem are not just pictures and status's they are personal emotions, feelings and beliefs which need to be safeguarded and respected especially with the growing phenomenon of social networking sites.
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**Bibliography**


Appendix A

Social Networking

This study is concerned about people’s social networking habits. Please answer each section as honestly as you can, do not spend too long thinking about each question as there are no right or wrong answers. Any information that you give will remain strictly confidential, you are not required to write your name anywhere on this survey. I hope you find this interesting, and I would like to thank you in advance for your time and co-operation.

Are you on facebook?
- Yes
- No

Gender
- Male
- Female

Age

How many friends do you have on Facebook?
- Less than 100
- between 101 and 300
- between 301 and 500
- between 501 and 700
- over 701

How often do you change your profile picture?
- Once a day
- Couple of times a week
- Once a week
- Couple of times a month
- Rarely

Who is in your profile picture?
• Just me
• Me and someone else (eg Friend, boyfriend, girlfriend)
• It is a group picture
• Other

How often do you log in to Facebook?
• Few times a day
• Once a day
• Few times a week
• Once a week
• Rarely

How long do you spend on Facebook on each log in?
• Less than 30 minutes
• Between 30 minutes and an hour
• Between one - two hours
• Over two hours

Do you have Facebook on your mobile?
• Yes
• No

INSTRUCTIONS: Please read the following statements and indicate how much you agree with them by circling the appropriate number to the right of the statement as follows: 1 = strongly agree
2 = agree 3 = disagree 4 = strongly disagree

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
</table>

I feel that I am a person of worth
I feel that i have a number of good qualities
All in all, I am inclined to feel that I am a failure
I am able to do things as well as most other people
I feel that i do not have much to be proud of
I take a positive attitude towards myself
On the whole, I am satisfied with myself
I wish I could have more respect for myself
I certainly feel useless at times
At times I think i am no good at all
**Tick the correct number with regard to**

With one meaning **VERY MUCH** like the word on the **LEFT** Two meaning **MOSTLY** like the word on the **LEFT** Three Meaning **A LITTLE** like the word on the **LEFT** Four meaning **EVENLY MIXED** Five meaning **A LITTLE** like the word on the **RIGHT** Six meaning **MOSTLY** like the word on the **RIGHT** Seven meaning **VERY MUCH** like the word on the **RIGHT**

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19

1 2 3 4 5 6 7
Antagonistic Acquiescent

20

1 2 3 4 5 6 7
Original Conventional

21

1 2 3 4 5 6 7
Reserved Friendly

22

1 2 3 4 5 6 7
Tense Unagitated

23

1 2 3 4 5 6 7
Quitting Persevering

24

1 2 3 4 5 6 7
Flexible Stubborn

25

1 2 3 4 5 6 7
Realistic Philosophical

26

1 2 3 4 5 6 7
Joiner Loner

27

1 2 3 4 5 6 7
Hardy Vulnerable

28

1 2 3 4 5 6 7
Orderly Disorganised
One of the first things I do each morning is log on to Facebook through my mobile or computer

- True
- False

I find it hard to control my use of Facebook

- True
- False

I feel lost when I cannot access Facebook

- True
- False

If you are concerned with or affected by any of the raised issues please do not hesitate to contact the following organisations. - Addictive Behaviour Centre 087-6858854 - The Hanly Centre 01 2809795 - Edenville Counselling 01 5252091 I would once again like to thank you for taking part in this study and would remind you that all information given here will remain strictly confidential. If you would like to know more about this study, please do not hesitate in contacting me at the address below. If you require any further information concerning this research, please contact Ciara Smith-Duff (1520760@mydbs.ie Researcher) and Bernadette Quinn (Bernadette.quinn@dbs.ie research co-ordinator).