

# **Investigating the relationship between: Smartphone Addiction, Social Anxiety, Self-Esteem, Age and Gender.**

Sinead Pugh

10207898

Submitted in partial fulfilment of the requirements of the BA Hons in Psychology

At Dublin Business School, School of Arts, Dublin.

Supervisor: Dr. Lee Richardson

Programme Leader: Dr. R. Reid

March 2017

Dublin Business School

## Table of Contents

1.0	Acknowledgments.....	1-3
2.0	Abstract.....	2-4
3.0	Introduction .....	3-5
3.1	The Smartphone.....	3-5
3.2	Smartphone Growth/Usage.....	3-6
3.3	Positive Impacts of the Smartphone.....	3-7
3.4	Negative Impacts of the Smartphone .....	3-8
3.5	Smartphone Addiction and Psychological Problems .....	3-9
3.6	Internet Addiction & Smartphone Addiction.....	3-10
3.7	Self-Esteem .....	3-12
3.8	Social Anxiety.....	3-13
3.9	Demographic Variables Age & Gender .....	3-14
3.10	Objective .....	3-15
4.0	Methodology.....	4-18
4.1	Participants .....	4-18
4.2	Design.....	4-18
4.3	Procedure.....	4-19
4.4	Materials (Measures used) .....	4-19
4.4.1	The Smartphone Addiction Scale (SAS-SV), (Kwon, Kim, et al., 2013).....	4-19
4.4.2	Rosenberg's Self-Esteem Scale (SES), (Rosenberg, M., 1965).....	4-20
4.4.3	The Interaction Anxiousness Scale (IAS) (Leary, 1983) .....	4-20
4.4.4	Demographic Variables .....	4-21
4.4.5	Data Analysis .....	4-21
5.0	Results.....	5-22
5.1	Section 1.....	5-22
5.1.1	Figure 1: Scatterplot.....	5-22
5.1.2	Table 1: Spearman's Rho Correlation .....	5-23
5.2	Section 2.....	5-23
5.2.1	Table 2: Descriptive Statistics .....	5-24
5.2.2	Table 3: Tests of Normality .....	5-24
5.2.3	Figure 2: Normal Q-Q Plot.....	5-25
5.2.4	Table 4: Test Statistics.....	5-25
5.2.5	Table 5: Test Ranks.....	5-26
6.0	Discussion.....	6-28

7.0	Conclusion.....	7-33
8.0	References .....	8-34
9.0	Appendix .....	9-44
9.1	Smartphone Addiction Scale.....	9-44
9.2	Rosenberg’s Self-Esteem Scale .....	9-45
9.3	The Interaction Anxiousness Scale.....	9-46

## 1.0 Acknowledgments

Firstly, I would like to thank my supervisor Dr. Lee Richardson for providing me with his patience, guidance, time and humour for the duration of my final year project.

I would particularly like to thank my parents Eileen and Derek for putting up with me over the last few weeks, for providing me with their constant support and encouragement, and finally for supporting me financially, for that I will be forever grateful.

## 2.0 Abstract

The aim of this study is to investigate the possible relationship between smartphone addiction, self-esteem, social anxiety, gender and age. The sample consisted of 126 participants (male = 36, female = 90) between the ages of 18-52 years old. Participants completed an online survey which comprised of three different questionnaires: The Smartphone Addiction Scale, Rosenberg's Self-Esteem Scale, and the Interaction Anxiousness Scale. Age and Gender were inputted by the researcher. A Spearman's Rho test was used to examine the relationship between the variables, and a Mann Whitney U test was used to examine the differences between the variables. The results revealed no significant relationship between the variables, however there were age and gender differences found between the variables examined.

## 3.0 Introduction

### 3.1 The Smartphone

When talking about smartphones today, it is usually in recognition of the likes of Apple iPhones and Android devices, however strictly speaking the evolution of the Smartphone began back in 1993 (Sarwar, M., & Soomro, T. R. (2013). The evolution of the smartphone can be divided into three main stages. For stage one, the target audience and the features and functions of the Smartphone were primarily for business and corporation purposes. For stage two, the primary aim was to introduce features that the general consumer requires and to reduce cost to increase buyers. For example, when Apple introduced the iPhone specifically for consumer use, a total of 500,000 were sold (Qureshi, (2012). Stage three which began in 2008 was mainly to do with improving the device in all ways possible, including battery life and display quality (Qureshi, (2012). ‘Blackberry is considered as the revolutionary device of this era, it introduced many features including Email, Internet, Fax, Web browsing, Camera’ (Sarwar, & Soomro, T. R. 2013). However, it wasn’t long until the industry introduced the Smartphone to the general consumers market (Qureshi, (2012).

Today, the Smartphone is equipped with many sophisticated features for consumer use; with this device, users can store photos, videos, memories, personal information and much more. It also allows the user to take photos and videos with its high quality camera, provides them with endless amounts of applications whether built-in or available to download for free or for a small cost such as online gaming, social-networking sites (SNS), navigation apps, music players, wireless internet, email, and skype, etc. For example, Android contained thousands of apps, and ‘by January 22nd, 2011, more than 350K apps are available on the AppStore with downloads of more than 10 billion’ (Xu, Qiang, et al, 2011). The Google Play Store formerly known as Android Market, surpassed 1 million apps in July 2013, and was most recently placed at 2.6 million apps in December 2016 (Statista, 2017).

### 3.2 Smartphone Growth/Usage

As the penetration of the smartphone in society today increases, there is a highly significant increase in the usage of the device especially amongst the youth (Bianchi & Phillips, 2005). Following the introduction of the Apple iPhone in 2006, and Android devices since the end of 2008, the smartphone market has grown worldwide at a steady pace (Batyuk et al., 2011). 'In the U.S, a total of 76.8 million people were using smartphones in May 2011' as cited in (Batyuk et al., 2011). As cited in Sarwar, M., & Soomro, T. R. (2013), a UK telecommunications regulator Ofcom released statistics from their study of smartphone usage in the United Kingdom showing that 37% of adults and 60% of teenagers admit that they are highly addicted to their smartphone, 51% of adults and 65% of teenagers said that they use their smartphone while socialising with others, and 22% of adults and 34% of teenagers said to have used their smartphone during mealtimes. While these statistics predict problematic usage to the device, the current study is concerned with smartphone addiction in Ireland.

In 2015, the eir Connected Living Survey which took place across 1,013 Irish households nation-wide showed that the proportion of smartphone users had almost doubled since 2012, the survey also reported that almost one in five admitted to accessing the internet almost every waking hour of the day, rising to 41% amongst 16 to 24 year olds. (Gordon, 2015). The theory of 'Generation Z' (otherwise known as 'Post-Millennials' or the 'Homeland Generation') is the 'demographic cohort following the millennials' which in the 1990's predicted that a significant aspect of this specific generation is its wide-spread usage of the internet from a young age (Strauss, W., & Howe, N. 1991). Members of this generation are typically thought to be comfortable with technology and interacting on social media websites for a specific portion of their socializing. Although there are no specific dates from when this cohort started, it was predicted that those with starting birth years ranging from the mid 1990's and early 2000s and ending in the late 2000s to early 2010 would be at highest

risk (Strauss, W., & Howe, N. 1991). Ironically, the Smartphone has become such a prevalent aspect of its user's daily life today that it has moved from being a useful 'technological object' to a key 'social object' (Srivastava, 2005), thus supporting such predictions.

Today, with a Smartphone it is possible for the user to stay connected with people, places and any interests that they may have at all times, due to the advanced features that they contain. However, with all of these advancements in the Smartphone, it could be said that now it is actually the user disconnecting from the device that its users are having issues with. The current study aims to explore such issues, specifically the relationship with the psychological issues.

### 3.3 Positive Impacts of the Smartphone

There has been a dramatic growth in broadband and Internet service providers over the past few years, which provides huge benefits to society e.g. business and social purposes. One of the most predominant reasons for this is the expanding usage of Smartphones and constant growth of Smartphone applications. These applications are user friendly, inexpensive and downloadable in majority of the Smartphones. As cited in Islam, R., Islam, R., & Mazumder, T. (2010), according to application area, the following is a list of 6 categories of mobiles applications:

- Communications: Internet, Email, Social Networking.
- Games: Action/ Adventure, Cards, Casino.
- Multimedia: Graphics/ Image viewer, Video Players, Audio players.
- Productivity: Calendar, Diary, Memo, Calculator.
- Travel: City guides, Maps, Translators.
- Utilities: Task manager, Call manager.

With all of these capabilities, the Smartphone can provide remarkable benefits to society. It can even make it possible for some physicians to send electronic prescriptions



(Goedert, J, 2003), as well as providing online therapies and applications for nutrition and physical activity behaviour change. (Hebden, Cook, van der Ploeg, & Allman-Farinelli, 2012). Among other benefits are online shopping, working from home, free video-calling family or friends from the other side of the world, and clinical support, (D. Grant & Scinta, 2015).

### 3.4 Negative Impacts of the Smartphone

The growth of the Smartphone has had a major negative impact on the PC market such as Microsoft and Intel. According to market research in 2011 the Smartphone outsold PC's with 73 million more being sold (Sarwar, M., & Soomro, T. R. (2013). Some of the other well-known negative consequences of mobile and Smartphone usage include that of dangerous driving (Green, 2001), harmful effects of radiation emitted from the device itself (Sandstrom et al., 2001), and in young people, the use of the device in school causing a reduction of concentration during class-time (Hiscock, 2004; Selwyn, 2003).

A more recent worry of the Smartphone is the risk of using the dating applications available. In Hong Kong, Choi et al., (2016) investigated the impacts of using these applications in comparison to using the old fashioned websites as there seemed to be higher risk in of engaging in unsafe sexual behaviours, their results suggested that users had greater sexual risks. Smartphone addiction can even cause physical health risks such as wrist and neck pains, blurred vision (Kwon et al., 2013) along with headaches, forgetfulness, and a clicking sound in the ears (Balikci, Cem Ozcan, Turgut-Balik, & Balik, 2005).

### 3.5 Smartphone Addiction and Psychological Problems

In addition to the effects mentioned previously, there are also numerous psychological effects associated with smartphone usage. . For many smartphone users, their phone is the first thing they look at in the morning, and the last thing they look at before going to sleep (Oulasvirta, Rattenbury, Ma, and Raita, 2012). With the operation of internet-based applications being one of the main features of the smartphone, many smartphone users have shown obsessive overuse and dependency of the device, as well as other factors that have concerning associations with mental health symptoms. Thomée, Eklöf, Gustafsson, Nilsson & Hagberg, (2007) looked at high levels of smartphone usage and found that it resulted in mental overload, disturbed sleep and the feeling of never being free.

Similarly, Leung (2008) investigated the relationship between Smartphone addiction and psychological attributes amongst adolescents and found that participants who scored low on self-esteem reported the most improper use of the mobile phone. In 2009, a study of 10,191 adolescents in Southern Taiwan investigated problematic phone use, functional impairment and its link with depression. Of the total figure, 27% reported using their phone much longer than intended, 18% tried and failed attempts at reducing their usage, 10% experienced functional impairment in their relationships and 36% experienced withdrawal symptoms (Yen et al., 2009). Similarly, Casey (2012) investigated Smartphone addiction and psychological attributes amongst university students and found a positive correlation between 'loneliness and shyness' and 'addiction'. Furthermore, Kim et al (2015) investigated the relationship among Smartphone addiction tendency, depression, aggression and impulsivity amongst college students in Cheonan and found that there was a statistically significant positive correlation between Smartphone addiction and depression, and positive correlations among Smartphone addiction, aggression and compulsion.

Although there is a substantial amount of research on psychological predictors of Smartphone addiction, there are some conflicting findings. For example, Bianchi & Phillips,

(2005) suggested that both anxiety and extra-version can significantly predict mobile phone addiction while Whiteside & Lynam, (2001) found that anxiety does not predict mobile phone addiction. These conflicting results show that there is a need for further research in this area. Similarly, some studies have found that there is no significant relationship between self-esteem and Smartphone addiction (Ehrenberg et al., 2008), while other studies suggest otherwise, e.g. Bianchi & Phillips (2005) found that low levels of self-esteem negatively predicts problematic mobile phone usage.

### 3.6 Internet Addiction & Smartphone Addiction

Young, (1998), investigated Internet Addiction and reported that some users of the internet were becoming addicted in similar ways to those who were addicted to drugs, alcohol or gambling, which created problems in work performance, academics, friendships, dating relationships, and even marital separation. Financial problems also arose for users who paid for certain on-line services. For example, 'one woman spent nearly \$800.00 in one month for on-line service fees' as cited in (Young, 1998). However further research suggests that the problem has worsened, and is causing serious psychological problems;

Whang, L., Lee, S., & Chang, G. (2003) performed a behaviour sampling analysis on Internet Addiction, showing a strong relationship between it and dysfunctional social behaviours. It also reported that those who classified as 'addicted' users contained the highest degree of loneliness, depressed mood and compulsivity compared to the others. Yen, Ko, Yen, Wu, & Yang (2007) demonstrated that adolescents with internet addiction had higher symptoms of Attention Deficit and Hyperactivity Disorder (ADHD), depression, social phobia and hostility. More recently, Choi et al., (2014) reported other problems including increased aggression, stress, loneliness and issues with memory and attention. With the operation of internet based activity being the primary use of the Smartphone today, it is likely that the problem is worsening. (Thatcher and Goolam (2005) suggested that the highest risk

group for internet addiction is those who use the internet for the social support features. Today these social networking sites (SNS) have increased in number, for example Facebook, Instagram, Snapchat, Twitter, interactive games, and other online messaging sites, and all of these SNS mentioned are available free of charge on the Smartphone today.

A lot of studies that have been undertaken on this topic have examined the 'mobile phone', however the current study will investigate the use of smartphones in particular, specifically due to the internet based activity of the Smartphone. Therefore, it is important to distinguish between mobile phones and smartphones. Mobile phones do not contain these internet based applications. The current study is therefore predicting that if mobile phones were creating addictive habits for the user, that the smartphone will have similar if not worse outcomes. Thorsteinsson & Page (2014) looked at the emotional attachments that smartphone users have towards their device and found that all participants displayed emotional attachments, even the brand of the smartphone played a part in the emotional attachment and social implications of the attachment.

The Internet and SNS are two prime accessories of the smartphone today, which allow its users to disengage from the demands of 'face to face' communication (Reid & Reid, 2007), therefore addictive usage predicts problems with socialising. As discussed previously, the internet provides benefits in its user's day to day life, however problematic usage has previously shown to have an effect on psychological well-being. The reason the internet is being considered is because these internet-based applications are the primary base of usage of the smartphone, therefore the two come hand in hand. The smartphone provides its users with 'internet-based communication, business trading, education, entertainment media, and even clinical applications' (Choi et al., 2014). In 2012, Choi et al., (2014) reported that there were over 1.08 billion global users.

### 3.7 Self-Esteem

According to Robinson, Shaver, & Wrightsman, (1991), Self-Esteem has been defined as the extent of which a person values, approves and likes oneself and the concept of self-esteem has been described in a number of ways such as self-worth, self-respect and self-acceptance. Rosenberg (1965) believes that self-esteem in young people is greatly associated with their peer relationship, particularly with those who link their self-worth with the approval of others. The advancement of mobile technology allows Internet access through smartphones. The fact that the smartphone allows its users to access these social networking sites at any given time or place, makes it very probable that self-esteem will be affected (Hong, Chiu, & Huang, 2012).

Valkenburg, Peter, and Schouten (2006) investigated friend networking sites, well-being and self-esteem and found that the frequency with which adolescents use social networking sites has an influence on their social self-esteem and well-being. Some of the antecedents of self-esteem and well-being including peer involvement and feedback on the self are more likely to occur on social networking sites rather than on other features of the internet.

Niemz, Griffiths, & Banyard, (2005) researched internet addiction amongst a sample of students across the United Kingdom and found correlations with high internet use and low self-esteem. They believed that because of their lack of confidence or shyness, they use the internet as an alternative form of communicating, as it allows them to open up and gain confidence without engaging in face to face communication. Similarly Vogel et al, (2014) found that those who reported a higher use of SNS such as Facebook, Twitter, or Instagram etc. had lower levels of self-esteem. However, a study in 2002 showed conflicting results which found that Internet use caused a significant increase in self-esteem and perceived social support and even decreased levels of loneliness (Shaw & Gant, 2002). These conflicting results suggest a need for further research. If a person is gaining higher self-

esteem and perceived social support by using the internet and Smartphone for SNS, on-line dating applications and more, it is very likely that they are going to repeat this behaviour, which could lead to problematic usage. Furthermore, if a person is experiencing low self-esteem, they may use the internet as a distraction (Young, K. S. 1999). The current study aims to investigate the relationship between self-esteem and smartphone addiction.

### 3.8 Social Anxiety

‘Anxiety is a cognitive and affective response characterized by apprehension about an impending, potentially negative outcome that one thinks one is unable to avert’, (Schlenker & Leary, 1982). Social Anxiety is one of the many forms of Anxiety, and be defined as anxiety resulting from the potential or presence of personal evaluation or judgement in real or imagined situations (Schlenker & Leary, 1982). Those who experience severe Social Anxiety tend to withdraw themselves from social situations and into isolation (Leary, 1983). Research has shown that isolated and anxious individuals thrive from online interaction (Yen et al., 2012).

Interacting online has been shown to be a useful tool for those individuals experiencing social anxiety, because they do not have to engage in face-to-face communication (Reid & Reid, 2007; Yen et al., 2012). Valkenburg & Peter, (2009) proposed that individuals who suffer from Social Anxiety often prefer the online settings available on social networking sites because it allows them to control message construction and be prepared for interaction ahead of time. However, it has been shown that this group of individuals are likely to develop problematic or addictive Internet use, (Caplan, 2002) which cited that the cognitive behavioural model of problematic internet usage (Davis, 2001) suggests that those who suffer from psychosocial problems are very likely to develop problematic internet usage.

Caplan, (2007) investigated the relationship between Loneliness, Social Anxiety and Problematic Internet use, and found that social anxiety is the ‘confounding variable’ that lies

between the two and thus provides preference for online social interaction, leading to problematic use of the internet. Furthermore, Reid & Reid, (2007) found that individuals experiencing social anxiety would use texting as their intimate form of contact over phone calls or face-to-face communication. These results suggest that social anxiety would encourage higher and possibly problematic smartphone use and higher Internet use. Problematic Internet use and smartphone use come hand in hand in this context as they are both using internet based applications as communication tools and disregard interpersonal interaction (Takao et al., 2009).

As shown previously in the eir Connected Survey in Ireland 2015, the number of smartphone users has increased dramatically in the past few years. And as cited in Lee, Chang, Lin, & Cheng, (2014), 83% of Smartphone users use the device for communication, therefore it is feasible to predict that people with high levels of Social Anxiety will display high levels of smartphone Addiction. The current study will investigate the relationship between Social Anxiety and smartphone Addiction.

### 3.9 Demographic Variables Age & Gender

The current study has also chosen to investigate whether the demographic variables ‘Age’ and/or ‘Gender’ will have a significant effect on smartphone addiction either in itself or within its relationship with self-esteem and/or social anxiety. Gender differences in the patterns of technology use has been a central topic in the debate regarding Information Communication Technology (ICT) use (Lu & Liu, 2011).

Gender difference in the patterns of social-networking use and technology use have been examined from researchers including (Boneva et al., 2001; & Thelwall, et al., 2010). Both findings indicated that females usually use technology for social contact and maintaining close relationships, while males tend to focus on online gaming and

entertainment. Before the smartphone came about, research suggested that males were prone to be higher users of technology, often because females would have found it more difficult to use. However the majority of the research undertaken specifically with phone usage would suggest that females show higher dependency to their phones than males (Weiser, E. B. 2000). Weiser, E. B. (2000) also investigated gender differences in internet use patterns and internet applications and found that male's use of the internet was related to leisure and entertainment, and females more for communicating and educational assistance. Bianchi & Phillips, (2005) found that female university students were more inclined to mobile phone use for maintaining social relationships. Billieux, Linden, & Rochat, (2008) also found that women are more likely to be dependent on their mobile phone.

Therefore the current researcher is interested in investigating whether there is any influence of gender on smartphone addiction. Age is also being accounted for as much of the previous research found that college or school students reported higher use of the device, (Gordon, (2015); Leung (2008), & Yen et al., (2009)). Therefore, the current researcher has predicted in agreement with the previous research, that the older the user, the less prone to addiction they will be.

### 3.10 Objective

In response to the previous literature regarding internet use/addiction, there has been numerous studies which have shown positive correlations with it and many different psychological problems, for example, Whang, L., Lee, S., & Chang, G. (2003) who performed a behaviour sampling analysis on internet addiction showing a strong correlation between it and dysfunctional social behaviours; Yen, Ko, Yen, Wu, & Yang (2007) who demonstrated a correlation with internet addiction and symptoms of attention deficit



hyperactivity disorder (ADHD), depression and hostility; and more recently, Choi et al., (2014) reported links with it and aggression, stress and loneliness.

The current researcher has also learned that with the smartphone today, its user can potentially access the internet at any given place or time, and that the use of these internet-based applications such as social-networking sites (Instagram, Facebook, and Twitter), online gaming and more are of the highest used applications of the smartphone today. This is due to extensive free Wi-Fi and 3G/4G mobile internet access. Therefore the researcher has predicted that smartphone addiction will have a similar relationship to psychological problems for its user as internet addiction has in the past.

The conflicting research on self-esteem has led the current researcher to include self-esteem in the investigation. The conflicting results suggest need for further research in that area. With regard to both self-esteem and social anxiety, the researcher believes the high use of social-networking and instant messaging on smartphones, is potentially being used as a medium of communication reducing and at times replacing face-to-face contact. Therefore it could be said that because the device is being used for maintaining close relationships and friendships, and essentially being used as one of the main sources of communication that lacks face-to-face contact, it could be causing problems with social skills, thus possibly resulting in social anxiety. This could also be due to the effects that various social-networking sites have on people's self-esteem (e.g. feelings of inadequacy and social comparison (Vogel et al, 2014)).

Therefore, the current study aims to investigate whether there is a relationship between smartphone addiction and psychological problems. More specifically, looking at whether self-esteem and social anxiety are predictors of smartphone addiction, and whether the demographic variables age and gender have any impact on these relationships.

To summarise, the present research hypothesises the following:

1. There will be a positive correlation observed between smartphone addiction and self-esteem.
2. There will be a positive correlation observed between smartphone addiction and social anxiety.
3. Females will report higher levels of smartphone addiction than males.
4. Age will be of significance in smartphone addiction; as age increases, smartphone addiction decreases.

An online survey will be conducted to explore these hypotheses, comprised of three sections. Smartphone addiction will be measured using the Smartphone Addiction Scale (Kwon, Kim, et al., 2013). Self-esteem will be measured using Rosenberg's Self-Esteem Scale (Rosenberg, M., 1965). Finally, social anxiety will be measured using the Interaction Anxiousness Scale (Leary, 1983). The researcher will input a demographic questionnaire within the survey in order to explore the impact of age and gender. A Pearson  $r$  correlation will be carried out in order to measure correlations between the variables. An independent Samples  $t$ -test will be carried out to assess the age and gender differences within the variables.

## 4.0 Methodology

### 4.1 Participants

A sample of 127 participants took part in the current study. This figure came from a random sample of the general population of Facebook users by using an online survey/questionnaire. Links to the questionnaires were released on a Facebook status via Google Docs by the researcher. They were also sent in private messages, asking Facebook users to invite their friends to participate as well as themselves. The idea behind this was to obtain a snowball effect sample. The questionnaires were anonymous and confidential, and the participants were given the opportunity to consent to taking part prior to completing them. No incentives were offered to take part. A total of 90 Females and 36 males took part in the study, ranging in age from 18 to 54. (Mean=25), (Mode=22), and (Std. Deviation = 7.508).

### 4.2 Design

The current study adopted a correlational design with a cross-sectional quantitative survey in order to investigate both correlations and independent samples. The predictor variables (PV) of this study were self-esteem and social anxiety. The criterion variable (CV) of this study was smartphone addiction. The demographic variables adopted in the study were gender and age which were used in order to compare the difference between each of the CV and PV Variables listed. However when running the tests on SPSS, the results did not meet the assumptions for parametric tests, therefore the researcher had to alternate the original tests that had been planned to use. This will be discussed in more detail in the results section.

### 4.3 Procedure

Participants who chose to take part in the study were debriefed prior to the completion of the questionnaires. In the debrief sheet they were informed that the study was interested in investigating the possible relationship between Smartphone Addiction, Self-Esteem, Social Anxiety, Age and Gender. It also notified them that in completing the questionnaires they were providing their consent. Anonymity and confidentiality of the questionnaires was emphasized. In the unlikely event that the questionnaires raised any negative or upsetting feelings for the participants, contact details for support services were attached. Contact details of the researcher's supervisor were also attached, should any concerns or questions arise for the participants. They were also notified that they could withdraw from the process at any time before submitting their answers. The Dublin Business School Ethics Committee granted ethical approval for this study.

### 4.4 Materials (Measures used)

#### 4.4.1 The Smartphone Addiction Scale (SAS-SV), (Kwon, Kim, et al., 2013)

The SAS-SV is a validated scale which was originally established in South Korea, but published in English (Kwon, Kim, et al., 2013). This scale is a shortened version of the original 40 itemed scale. It is a ten itemed questionnaire used to assess levels of smartphone addiction. Participants are asked to rate on a dimensional scale how much each statement relates to them, (1 "strongly disagree" to 6 "strongly agree"). Example items include 'Having a hard time concentrating in class, while doing assignments, or while working due to smartphone use', 'Feeling impatient and fretful when I am not holding my smartphone', 'Missing planned work due to smartphone use' and 'Constantly checking my smartphone so as not to miss conversations between other people on Twitter or Facebook'. The total score ranges from 10 to 60, with the highest score being the maximum presence of "Smartphone

addiction” in the past year. The final 10 questions were chosen with regard content validity, and the original SAS-SV showed content and concurrent validity and internal consistency (Cronbach's alpha: 0.91). Furthermore, support for validity of this scale is that it has been used in various recent research across cultures including (Lopez-Fernandez, 2017), (Noyan, Darcin, et al., 2015). The scale is very quick and easy to use, there are no reverse scores involved.

#### 4.4.2 Rosenberg’s Self-Esteem Scale (SES), (Rosenberg, M., 1965)

The Rosenberg SES is a 10-item scale that measures global self-worth through the measuring of both positive and negative feelings about oneself. The scale has been described as uni-dimensional, and all of the items are rated on a 4-point Likert scale (1 “strongly agree” to 4 “strongly disagree”). This Scale is a widely used instrument for evaluating individual self-esteem. Example items include ‘On the whole, I am satisfied with myself’ and ‘I take a positive attitude toward myself’. The original reliability of the scale is 0.72 and it has proven to be highly reliable and consistent, as well as convergent and discriminant validity. It has been explored using different samples from different countries and states by researchers such Mehdizadeh (2010) in the United Kingdom, Michigan (United States) by (Steinfeld et al., 2008) and California by (Robins et al, 2001). When scoring this scale items 3, 5, 8, 9, and 10 are reversed in valence. The total scale ranges from 0-30. Scores within 15-25 are normal range and scores below 15 suggest low self-esteem.

#### 4.4.3 The Interaction Anxiousness Scale (IAS) (Leary, 1983)

The IAS Scale is a 15 item scale that measures global interaction anxiousness. Participants are asked to rate themselves on how characteristic each of the items are to them. The IAS has received widespread use and has a body of data to support its validity. Correlations with other relevant social and general anxiety confirm its convergent and discriminant validity. Each of the 15 items are rated on a 5 point scale (1= ‘Not at all characteristic of me’ and 5= ‘Extremely characteristic of me’). When scoring this scale, items

2, 3, 6, 10, and 15 are reverse scored. Example items include 'I often feel nervous even in casual get-togethers', 'parties often make me feel anxious and uncomfortable' and 'in general, I am a shy person'. See Appendix for the full scale. (Leary & Kowalski, 1993).

#### 4.4.4 Demographic Variables

The demographic variables included in the surveys were that of gender and age.

#### 4.4.5 Data Analysis

SPSS Statistics Version 20 was used to analyse data. Each of the online surveys were created through Google Forms, and responses were then downloaded and coded through MS Excel and into SPSS.

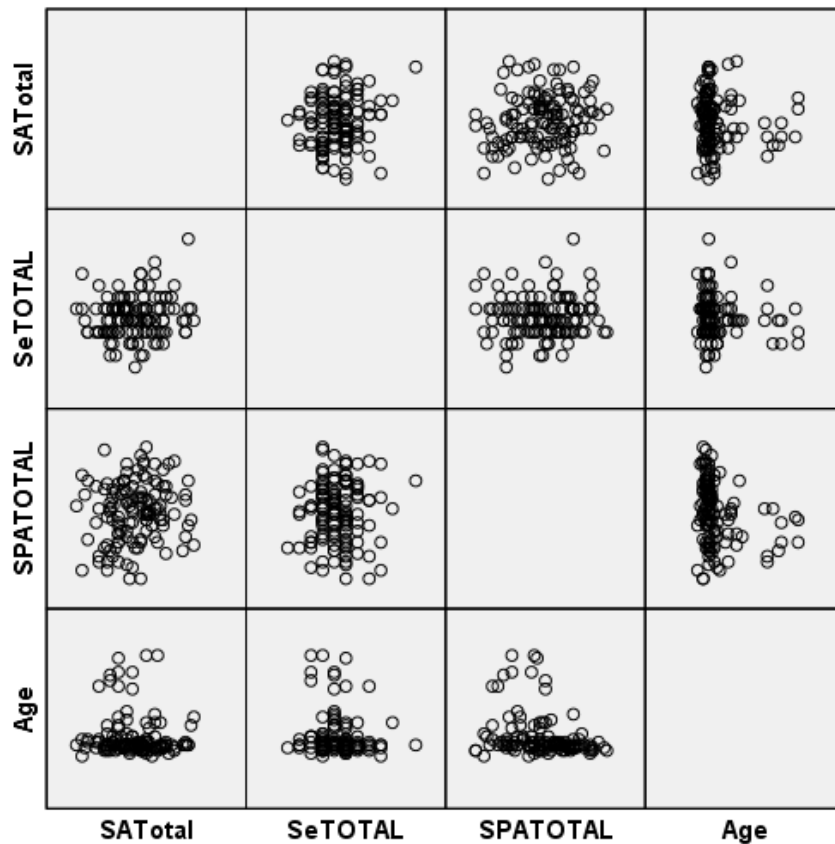
## 5.0 Results

This aim of this section of the study is to provide a clear and concise report of the results found in the current study. The researcher has split it into two sections. Section 1 is reporting on any correlations/relationships that exist between the variables, and Section 2 is reporting on any differences that exist within the variables in terms of Age and Gender.

### 5.1 Section 1

In order to determine whether a linear relationship existed between Smartphone Addiction (SPA), Self-Esteem (SE), Social Anxiety (SA) and Age (A), a scatter plot was conducted. As displayed in *Figure 1 below*, no linear relationship existed between the variables, and so the assumptions for a parametric test were not met.

5.1.1 Figure 1: Scatterplot



Therefore, a Spearman's Rho (non-parametric test) was conducted in place of the Pearson r correlation in order to determine whether there was any association between the variables. As shown in *Table 1 below*, A Spearman's Rho correlation found that a significant moderate negative correlation existed between Age and Smartphone Addiction, that is, as Age increases, Smartphone Addiction decreases, (Rho (124) =  $-.339$ ,  $p < .005$ ). This result supports Hypothesis 4 which predicted that smartphone addiction would significantly differ with age. However, there were no further significant correlations between the remaining variables, ( $P > .05$ ), thus contradicting the remaining hypothesis.

5.1.2 Table 1: Spearman's Rho Correlation

			SATotal	SeTOTAL	SPATOTAL	Age
Spearman's rho	SATotal	Correlation Coefficient	1	.099	.127	-.100
		Sig. (2-tailed)	.	.268	.158	.264
		N	126	126	126	126
	SeTOTAL	Correlation Coefficient	.099	1.000	.055	-.139
		Sig. (2-tailed)	.268	.	.544	.122
		N	126	126	126	126
	SPATOTAL	Correlation Coefficient	.127	.055	1.000	-.339**
		Sig. (2-tailed)	.158	.544	.	.000
		N	126	126	126	126
	Age	Correlation Coefficient	-.100	-.139	-.339**	1
		Sig. (2-tailed)	.264	.122	.000	.
		N	126	126	126	126

## 5.2 Section 2

This section of the results is interested in investigating whether any significant differences exist between the variables. As displayed in *Table 2 below*, there appears to be a difference between males and females in both Social Anxiety and Smartphone Addiction. In order to determine whether there were any difference in the variables between males and



females, a Test of Normality was conducted. As displayed in table 3 below, Shapiro Wilk reported no significant results, with the exception of Self Esteem in females.

### 5.2.1 Table 2: Descriptive Statistics

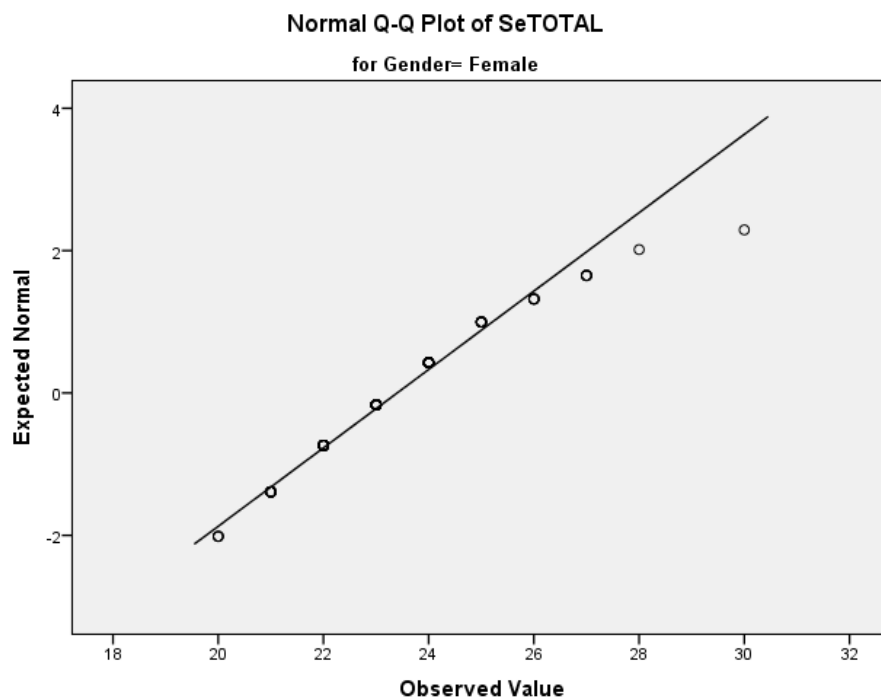
Gender		N	Minimum	Maximum	Mean	Std. Deviation
Male	SATotal	36	20	55	37.0833	8.19887
	SeTOTAL	36	19	26	23.1667	1.50238
	SPATOTAL	36	10	52	29.1389	11.39462
	Valid N (listwise)	36				
Female	SATotal	90	22	62	42.3444	9.11248
	SeTOTAL	90	20	30	23.4	1.81628
	SPATOTAL	90	13	57	36.1889	9.74379
	Valid N (listwise)	90				

### 5.2.2 Table 3: Tests of Normality

		Kolmogorov-Smirnova			Shapiro-Wilk		
	Gender	Statistic	df	Sig.	Statistic	df	Sig.
SATotal	Male	0.094	36	.200*	0.987	36	0.936
	Female	0.063	90	.200*	0.986	90	0.454
SeTOTAL	Male	0.15	36	0.039	0.943	36	0.062
	Female	0.171	90	0	0.94	90	0
SPATOTAL	Male	0.112	36	.200*	0.962	36	0.24
	Female	0.066	90	.200*	0.989	90	0.627

In addition, a Normal Q-Q Plot indicated that Self-Esteem was not normally distributed, therefore that conditions for a parametric test were not met. This can be seen in *Figure 2* below.

## 5.2.3 Figure 2: Normal Q-Q Plot



Therefore, in place of the Independent Samples t-test, a Mann-Whitney U Test was performed as shown in *Table 4* and *5* below in order to investigate whether gender would have an impact on each of the variables. Prior to running this test, a Bonferroni Correction was performed in order to reduce the chances of obtaining false-positive results. This was because three tests were being performed ( $5\% / 3$ ), the results were below .017 thus met the assumptions

## 5.2.4 Table 4: Test Statistics

Column1	SATotal	SeTOTAL	SPATOTAL
Mann-Whitney	1093.5	1570.5	1063.5
Wilcoxon W	1759.5	2236.5	1729.5
Z	-2.846	-0.273	-3.007
Asymp. Sig. (2-tailed)	0.004	0.785	0.003

5.2.5 Table 5: Test Ranks

	Gender	N	Mean Rank	Sum of Ranks
SATotal	Male	36	48.88	1759.5
	Female	90	69.35	6241.5
	Total	126		
SeTOTAL	Male	36	62.13	2236.5
	Female	90	64.05	5764.5
	Total	126		
SPATOTAL	Male	36	48.04	1729.5
	Female	90	69.68	6271.5
	Total	126		

The Mann-Whitney U test revealed that there is a significant difference in both Social Anxiety between males and females, and Smartphone Addiction between males and females. As shown in Table 2 (descriptive statistics), Females (Mean = 42.34) scored significantly higher than males (Mean = 37.08) on Social Anxiety. Similarly, Females (Mean = 36.19) scored significantly higher than males (Mean = 29.14). These results support the literature review as will be discussed furthermore in the next section. Note of caution: there were 90 female and 36 male participants in total.

To summarise, no significant relationship existed between smartphone addiction, self-esteem and social anxiety. Therefore hypotheses 1 and 2 were rejected. However, there was a significant difference within males and females, females scoring significantly higher than males in smartphone addiction and social anxiety. This result supported hypothesis 3; that females would score higher in smartphone addiction. Although there was a significant difference in males and females in social anxiety, the researcher did not hypothesise this outcome. Finally, results showed a significant negative correlation between age and smartphone addiction, that is, as age increases, smartphone addiction decreases. This result supported hypothesis 4.

## 6.0 Discussion

The aim of the present study was firstly to investigate whether a relationship existed between Smartphone Addiction, Social Anxiety, and Self-Esteem and over all to investigate whether the demographic variables Age and Gender would have an influence on these relationships. The predictor variables (PV) were self-esteem and social anxiety, and the criterion variable (CV) was smartphone addiction.

The study adopted a cross-sectional correlational design with quantitative surveys in order to investigate whether any significant relationships existed between the variables. The data was collected through online surveys which were created via Google Forms and distributed through Facebook with the intention of obtaining a snowball effect sample. The Smartphone Addiction scale (SAS) was used in order to measure the participant's level of smartphone addiction. Rosenberg's Self-Esteem Scale (SES) was used to measure their levels of self-esteem, and the Interaction Anxiousness Scale (IAS) to measure social anxiety levels. Age and Gender were integrated to the survey by the researcher.

A total of 126 participants (N=126) between the ages of 18 and 54 took part in the study. 90 of which were female and 36 of which were male. The mean age of the participants was 25 years old (M= 25). All subjects who took part did so with their consent. The questionnaires were all completed online and anonymously. There were no incentives for the participants to take part in the study.

Hypotheses 1 and 2 predicted that a significant relationship/correlation would exist between Smartphone Addiction, Self-Esteem and Social Anxiety. Therefore, the researcher

produced a scatter plot through SPSS in order to see whether any linear relationship existed between the variables, however no correlation was found to support this (see Figure 1 in results section). This result did not support the hypotheses.

Therefore, the researcher had to adopt non-parametric tests in place of the parametric tests that had been originally planned to use in order to investigate the possible relationships between the variables, as well as further investigating the possible impact of the demographic variables age and gender. For that reason, a Spearman's Rho test was conducted in place of the Pearson r correlation in order to determine whether any relationship existed between the variables.

A significant moderate negative correlation was found between Age and Smartphone Addiction. That is, as age increases, smartphone addiction decreases ( $Rho(124) = -.339, p = < .005$ ). This result supports hypothesis 4. However, further research could look specifically within the younger age group, as the mean age of participants ( $N = 126$ ) was 25 years old ( $M = 25$ ). There is definitely a need for research within the younger generation, as discussed previously the theory of 'Generation Z' predicted that those with starting birth years ranging from the mid 1990's and early 2000s and ending in the late 2000s to early 2010 would be at highest risk (Strauss, W., & Howe, N. 1991).

However, no other significant relationship was found between the remaining variables, thus contradicting the remaining Hypotheses. With that in mind, the researcher believes that had there been more control on the age group (targeting specifically the younger group), there could have been more significant findings. This will be discussed further within the limitations of the study.

Furthermore, in section 2 of the results the researcher focused on whether any significant difference were present between the variables. In order to determine any

differences in gender, a Test of Normality was conducted. As displayed in table 3 of the results, Shapiro Wilk reported no significant results with the exception of self-esteem in females (Sig. = .000). In addition, a Normal Q-Q Plot (see Figure 2 in results section) indicated that self-esteem was not normally distributed. Thus assumptions for a parametric test were again not met.

Nonetheless, a Mann-Whitney U Test was performed (see Table 4 & 5) in place of the Independent Samples t-test in order to investigate whether gender would have an impact on each of the variables. A Bonferroni Correction was performed prior to running this test, because three tests were being performed ( $5\% / 3$ ). The results were below .017 thus met the assumptions.

The Mann-Whitney U test revealed a significant difference (a) Social Anxiety between males and females, and (b) Smartphone Addiction between males and females. As shown in Table 2 (descriptive statistics), Females (Mean = 42.34) scored significantly higher than males (Mean = 37.08) on Social Anxiety. Similarly, Females (Mean = 36.19) scored significantly higher than males (Mean = 29.14).

This result supported hypothesis 3 which predicted that females would report higher in smartphone addiction. Although the researcher did not hypothesize a gender difference social anxiety, this result was also aligned with the literature review.

With regard to smartphone addiction, Weister, E. B. (2000) indicated that majority of research undertaken regarding phone use suggested that females show higher dependency of the device than males. Similarly, Bianchi & Phillips, (2005) found that females are more likely to depend on their phone for socialising and it has been shown that social-networking is a primary use of the device today, thus suggesting that they would report higher in smartphone addiction. Furthermore, Billieux, Linden, & Rochat, (2008) also found that

women are more likely to be dependent on their phone therefore this result is widely supported by previous research.

With regard to self-esteem, the results of this study contradicted some of the theories in the literature review. For example Hong, Chiu, & Huang, (2012) predicted that smartphones will affect self-esteem due to the easy access it provides its users to social-networking sites. Although few studies had specifically looked at smartphone addiction and self-esteem, internet use and social-networking sites had previously shown to correlate with those with low self-esteem (Vogel et al, 2014), (Valkenburg, Peter, and Schouten 2006). However as discussed in the literature review these findings conflicted with the findings of Shaw & Gant (2002) who found that internet-based activity caused a significant increase in self-esteem. Therefore, it could be said that further research in the area is needed, potentially looking at the positives and negatives of internet use and seeing where the danger lies.

The current researcher predicted that results would have been similar for the smartphone. This was due to the fact that research today has shown that the internet based applications are the highest used function of the smartphone. However, it could be said that the results would have been more significant had the researcher included a scale which would have measured the patterns and intensity of the usage of the device such as The Facebook Intensity Scale (FBI) (Ellison, N. B., et al. 2007). The SPA scale did not specifically ask much about the use of social-networking sites, therefore participants could have been answering with regard general use of the device.

One of the main limitations of this study was that it relied on the honesty and integrity of the participants. The researcher believes that some people can be less open when providing personal information online, as they cannot see where it is going. For that reason, if the study was to be replicated or furthered, the researcher would have the participants



complete the surveys in writing and put theirs in a sealed box anonymously. This would not be necessary for all types of studies, however the researcher feels that some of the questions on the questionnaires used were very personal. For example Rosenberg's self-esteem scale item two 'at times, I feel no good at all' or item 6 'I certainly feel useless at times'.

To reiterate what was briefly noted previously, the lack of control on the age and variables is seen as a limitation to the researcher. The average age of the sample obtained was 25 years old, and little significant results were found for the predicted relationships. However, the fact that majority of the participants were in their early 20's, the results suggest that their age group is not hugely effected by problematic smartphone usage. Further research would need to verify this idea. In terms of young adolescents, it seems that the idea of Generation Z could have made a very sufficient prediction. For that reason if the researcher was to further investigating this topic, it would be specifically within that age group.

Furthermore, the researcher believes a much larger sample should be obtained in future studies on this topic, and more control on gender. The point of the snowball effect was to obtain a wider range of participants, however this was not the outcome for the current study.

With that being said, a positive outcome is that the current study has opened a window for further research on a very interesting topic. Smartphone addiction is a very prominent problem in society today. Perhaps investigating something more specific in terms of the patterns and usage of the device would be more substantial. The fact the females reported higher in smartphone addiction, further research could investigate the differences in usage of the device between the genders, or specifically within females.

Furthermore, the fact that females reported significantly higher in social anxiety than males could suggest that those in their early/mid 20's are a target sample for social anxiety.

Again, any future replications of this study could go further and gain a wider sample and explore social anxiety within this age group between genders or specifically at females exploring possible factors which influence the issue.

## 7.0 Conclusion

In conclusion, the current study sought to investigate (a) whether a relationship existed between smartphone addiction, self-esteem and social anxiety, (b) to investigate whether age and gender differences had an influence on these relationships/variables. The Smartphone Addiction scale (SAS) was used in order to measure smartphone addiction. Rosenberg's Self-Esteem Scale (SES) was used to measure their levels of self-esteem, and the Interaction Anxiousness Scale (IAS) to measure social anxiety levels. Age and Gender were integrated to the survey by the researcher. These scales and demographic variables were all created into an online survey via Google Docs, and then distributed through Facebook. A total of 126 participants took part in the study. This study showed some inconsistencies to previous literature on this topic as hypotheses 1 and 2 were rejected. However hypotheses 3 and 4 were supported, and another significant finding was shown in the results which was not hypothesized. Although hypotheses 1 and 2 did not produce significant findings, there is still numerous areas in this topic to be discussed. Finding out the negative psychological effects of addictive smartphone usage is very beneficial particularly in society today. Significant research of the impact the device can have on a person, will also enable individuals to have a better understanding of themselves.

## 8.0References

Balikci, K., Cem Ozcan, I., Turgut-Balik, D., & Balik, H. (2005). A survey study on some neurological symptoms and sensations experienced by long term users of mobile phones. *Pathologie Biologie*, 53(1), 30-34 <http://dx.doi.org/10.1016/j.patbio.2003.12.002>.

Batyuk, L., Herpich, M., Ahmet Camtepe, S., Raddatz, K., Schmidt, A. and Albayrak, S. (2011). Using static analysis for automatic assessment and mitigation of unwanted and malicious activities within Android applications, 1st ed. [ebook] Berlin, pp.1-2 Available at: <https://pdfs.semanticscholar.org/e901/e9628a03ea65910def46eda050fb26f7eedf.pdf>

Bian, M. & Leung, L. (2014). Linking Loneliness, Shyness, Smartphone Addiction Symptoms, and Patterns of Smartphone Use to Social Capital *Social Science Computer Review*, 33(1), 61-79 <http://dx.doi.org/10.1177/0894439314528779>.

Briggs, S. & Cheek, J. (1986). The role of factor analysis in the development and evaluation of personality scales. *Journal Of Personality*, 54(1), 106-148, <http://dx.doi.org/10.1111/j.1467-6494.1986.tb00391.x>.

Caplan, S. (2007). Relations Among Loneliness, Social Anxiety, and Problematic Internet Use. *Cyberpsychology & Behavior*, 10(2), 234-242. <http://dx.doi.org/10.1089/cpb.2006.9963>

Casey, B. (2012). Linking Psychological Attributes to Smart Phone Addiction, Face-to-Face Communication, Present Absence and Social Capital (1st ed.), Hong Kong, Retrieved from [http://pg.com.cuhk.edu.hk/pgp\\_nm/projects/2012/BIAN%20Mengwei%20Casey.pdf](http://pg.com.cuhk.edu.hk/pgp_nm/projects/2012/BIAN%20Mengwei%20Casey.pdf).

Choi, E., Wong, J., Lo, H., Wong, W., Chio, J., & Fong, D. (2016). The Impacts of Using Smartphone Dating Applications on Sexual Risk Behaviours in College Students in Hong Kong. PLOS ONE, 11(11), e0165394. <http://dx.doi.org/10.1371/journal.pone.0165394>.

Choi, H., Lee, H., & Ha, J. (2012). The influence of smartphone addiction on mental health, campus life and personal relations - Focusing on K university students. Journal of the Korean Data and Information Science Society, 23(5), 1005-1015 <http://dx.doi.org/10.7465/jkdi.2012.23.5.1005>.

Choi, S., Mok, J., Kim, D., Choi, J., Lee, J., & Ahn, H. et al. (2014). Latent class analysis on internet and smartphone addiction in college students. Neuropsychiatric Disease and Treatment, 817. <http://dx.doi.org/10.2147/ndt.s59293>.

Christensson, P. (2010, July 30). Smartphone Definition. Retrieved 2017, Feb 21, from <https://techterms.com>.

Crosta, P. (2009). Anxiety: Causes, Symptoms and Treatments. Medicalnewstoday.com. Retrieved 28 January 2017, from <http://www.medicalnewstoday.com/info/anxiety>.

D. Grant, W. & Scinta, W. (2015). Increased Interaction with Weight Loss App Increases Likelihood of Sustained Weight Loss. *Endocrinology & Metabolic Syndrome*, 04(04) <http://dx.doi.org/10.4172/2161-1017.1000210>.

Davis, R. A., Flett, G. L., & Besser, A. (2002). Validation of a new scale for measuring problematic internet use: Implications for pre-employment screening [Special issue: Internet and the workplace], *CyberPsychology & Behavior*, 5, 331–345.

Goedert, J. (2003). Vendors see a wireless revolution. *Health data management*, 11(7), 52-53.

Griffiths, M. (2000). Internet Addiction - Time to be Taken Seriously? *Addiction Research*, 8(5), 413-418. <http://dx.doi.org/10.3109/16066350009005587>.

Griffiths, M. (2005). A 'components' model of addiction within a biopsychosocial framework. *Journal Of Substance Use*, 10(4), 191-197 <http://dx.doi.org/10.1080/14659890500114359>.

Hebden, L., Cook, A., van der Ploeg, H., & Allman-Farinelli, M. (2012). Development of Smartphone Applications for Nutrition and Physical Activity Behavior Change. *JMIR Research Protocols*, 1(2), e9. <http://dx.doi.org/10.2196/resprot.2205>

Hiscock, D. (2004). Cell phones in class: This, too, shall pass? Community College

Hong, F., Chiu, S., & Huang, D. (2012). A model of the relationship between psychological characteristics, mobile phone addiction and use of mobile phones by Taiwanese university female students. *Computers In Human Behavior*, 28(6), 2152-2159  
<http://dx.doi.org/10.1016/j.chb.2012.06.020>.

Islam, R., Islam, R., & Mazumder, T. (2010). Mobile application and its global impact. *International Journal of Engineering & Technology (IJEST)*, 10(6), 72-78.  
<http://www.ijens.org/107506-0909%20ijet-ijens.pdf>

Kim, M., Kim, H., Kim, K., Ju, S., Choi, J. and Yu, M. (2015), Smartphone Addiction: (Focused Depression, Aggression and Impulsion) among College Students. *Indian Journal of Science and Technology*, 8(25).

Kwon, M., Kim, D., Cho, H., & Yang, S. (2013). The Smartphone Addiction Scale: Development and Validation of a Short Version for Adolescents. *Plos ONE*, 8(12), e83558.  
<http://dx.doi.org/10.1371/journal.pone.0083558>

Kwon, M., Lee, J., Won, W., Park, J., Min, J., & Hahn, C. et al. (2013). Development and Validation of a Smartphone Addiction Scale (SAS). *Plos ONE*, 8(2), e56936  
<http://dx.doi.org/10.1371/journal.pone.0056936>.

Leary, M. R. (1983). Social anxiousness: The construct and its measurement. *Journal of Personality Assessment*, 47(1), 66–75.

Lee, Y., Chang, C., Lin, Y., & Cheng, Z. (2014). The dark side of smartphone usage: Psychological traits, compulsive behavior and technostress. *Computers In Human Behaviour*, 31, 373-383, <http://dx.doi.org/10.1016/j.chb.2013.10.047>.

Leung, L. (2008). LINKING PSYCHOLOGICAL ATTRIBUTES TO ADDICTION AND IMPROPER USE OF THE MOBILE PHONE AMONG ADOLESCENTS IN HONG KONG. *Journal Of Children And Media*, 2(2), 93-113 <http://dx.doi.org/10.1080/17482790802078565>.

Lopez-Fernandez, O. (2017). Short version of the Smartphone Addiction Scale adapted to Spanish and French: Towards a cross-cultural research in problematic mobile phone use. *Addictive Behaviors*, 64, 275-280. <http://dx.doi.org/10.1016/j.addbeh.2015.11.013>

Niemz, K., Griffiths, M., & Banyard, P. (2005). Prevalence of Pathological Internet Use among University Students and Correlations with Self-Esteem, the General Health Questionnaire (GHQ), and Disinhibition. *Cyberpsychology & Behavior*, 8(6), 562-570 <http://dx.doi.org/10.1089/cpb.2005.8.562>.

Noyan, C., Darcin, A., Nurmedov, S., Yilmaz, O., & Dilbaz, N. (2015). Validity and reliability of the Turkish version of the Smartphone Addiction Scale-Short Version among university students. *Anatolian Journal Of Psychiatry*, 16, 73.

<http://dx.doi.org/10.5455/apd.176101>

Oulasvirta, A., Rattenbury, T., Ma, L., & Raita, E. (2011). Habits make smartphone use more pervasive. *Personal And Ubiquitous Computing*, 16(1), 105-114,

<http://dx.doi.org/10.1007/s00779-011-0412-2>.

Qureshi, H. (2012). Apple: from iPhone 1 to iPhone 5 - Evolution, Features and Future Review TheNewsTribe. Retrieved 20 January 2017, from

<http://www.thenewstribes.com/2012/07/16/apple-from-iphone-1-to-iphone-5-evolution-features-and-future-review/>

Robinson, J., Shaver, P., & Wrightsman, L. (1991). Measures of Personality and Social Psychological Attitudes (1st ed.), Retrieved from

[https://books.google.ie/books?hl=en&lr=&id=uOtFBQAAQBAJ&oi=fnd&pg=PA115&dq=self+esteem+definition&ots=rhg9Y6-s-](https://books.google.ie/books?hl=en&lr=&id=uOtFBQAAQBAJ&oi=fnd&pg=PA115&dq=self+esteem+definition&ots=rhg9Y6-s-3&sig=gu4xhRfNS7BHrnuKByPzrvs2dhM&redir_esc=y#v=onepage&q=self%20esteem%20definition&f=false)

[3&sig=gu4xhRfNS7BHrnuKByPzrvs2dhM&redir\\_esc=y#v=onepage&q=self%20esteem%20definition&f=false.](https://books.google.ie/books?hl=en&lr=&id=uOtFBQAAQBAJ&oi=fnd&pg=PA115&dq=self+esteem+definition&ots=rhg9Y6-s-3&sig=gu4xhRfNS7BHrnuKByPzrvs2dhM&redir_esc=y#v=onepage&q=self%20esteem%20definition&f=false)

Sarwar, M., & Soomro, T. R. (2013). Impact of Smartphone's on Society. *European journal of scientific research*, 98(2), 216-226.



Schlenker, B. & Leary, M. (1982). Social anxiety and self-presentation: A conceptualization model. *Psychological Bulletin*, 92(3), 641-669, <http://dx.doi.org/10.1037//0033-2909.92.3.641>.

Statista,. (2017). *App stores: number of apps in leading app stores 2016* / Statista. Statista. Retrieved 15 January 2017, from <https://www.statista.com/statistics/276623/number-of-apps-available-in-leading-app-stores/>

Shaw, L. & Gant, L. (2002). In Defense of the Internet: The Relationship between Internet Communication and Depression, Loneliness, Self-Esteem, and Perceived Social Support *Cyberpsychology & Behavior*, 5(2), 157-171, <http://dx.doi.org/10.1089/109493102753770552>.

Srivastava, L. (2005). Mobile phones and the evolution of social behaviour. *Behaviour & Information Technology*, 24(2), 111-129, <http://dx.doi.org/10.1080/01449290512331321910>.

Strauss, W., & Howe, N. (1991). Generation Z.

Takao, M., Takahashi, S., & Kitamura, M. (2009). Addictive personality and problematic mobile phone use, *CyberPsychology & Behavior*, 12(5), 501–507.

Thorsteinsson, G. & Page, T. (2014). User attachment to smartphones and design guidelines. *International Journal Of Mobile Learning And Organisation*, 8(3/4), 201  
<http://dx.doi.org/10.1504/ijmlo.2014.067020>.

Valkenburg, P. M., Peter, J., & Schouten, A. P. (2006), Friend networking sites and their relationship to adolescents' well-being and social self-esteem, *CyberPsychology & Behavior*, 9(5), 584-590.

Vogel, E., Rose, J., Roberts, L., & Eckles, K. (2014). Social comparison, social media, and self-esteem. *Psychology Of Popular Media Culture*, 3(4), 206-222,  
<http://dx.doi.org/10.1037/ppm0000047>.

Weiser, E. (2000). Gender Differences in Internet Use Patterns and Internet Application Preferences: A Two-Sample Comparison. *Cyberpsychology & Behavior*, 3(2), 167-178  
<http://dx.doi.org/10.1089/109493100316012>.

Weiser, E. B. (2000). Gender differences in Internet use patterns and Internet application preferences: A two-sample comparison. *CyberPsychology and Behavior*, 3(2), 167-178.

Whang, L., Lee, S., & Chang, G. (2003). Internet Over-Users' Psychological Profiles: A Behavior Sampling Analysis on Internet Addiction. *Cyberpsychology & Behavior*, 6(2), 143-150. <http://dx.doi.org/10.1089/109493103321640338>

Whiteside, S. & Lynam, D. (2001). The Five Factor Model and impulsivity: using a structural model of personality to understand impulsivity, *Personality And Individual Differences*, 30(4), 669-689. [http://dx.doi.org/10.1016/s0191-8869\(00\)00064-7](http://dx.doi.org/10.1016/s0191-8869(00)00064-7).

Wu, S. I. (2003). The relationship between consumer characteristics and attitude toward online shopping. *Marketing Intelligence & Planning*, 21(1), 37-44.

Xu, Q., Erman, J., Gerber, A., Mao, Z., Pang, J., & Venkataraman, S. (2011, November). Identifying diverse usage behaviors of smartphone apps. In *Proceedings of the 2011 ACM SIGCOMM conference on Internet measurement conference* (pp. 329-344). ACM.

Yen, C., Tang, T., Yen, J., Lin, H., Huang, C., Liu, S., & Ko, C. (2009). Symptoms of problematic cellular phone use, functional impairment and its association with depression among adolescents in Southern Taiwan. *Journal Of Adolescence*, 32(4), 863-873  
<http://dx.doi.org/10.1016/j.adolescence.2008.10.006>.

Yen, J., Ko, C., Yen, C., Wu, H., & Yang, M. (2007). The Comorbid Psychiatric Symptoms of Internet Addiction: Attention Deficit and Hyperactivity Disorder (ADHD), Depression, Social Phobia, and Hostility. *Journal Of Adolescent Health*, 41(1), 93-98,  
<http://dx.doi.org/10.1016/j.jadohealth.2007.02.002>.

YOUNG, K. (1998). Internet Addiction: The Emergence of a New Clinical Disorder. *Cyberpsychology & Behavior*, 1(3), 237-244. <http://dx.doi.org/10.1089/cpb.1998.1.237>.

Young, K. S. (1999). Internet addiction: symptoms, evaluation and treatment. *Innovations in clinical practice: A source book*, 17, 19-31.

## 9.0 Appendix

### 9.1 Smartphone Addiction Scale

		<b>Strongly disagree</b>	<b>Disagree</b>	<b>Weakly disagree</b>	<b>Weakly agree</b>	<b>Agree</b>	<b>Strongly agree</b>
1	Missing planned work due to smartphone use	Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree
2	Having a hard time concentrating in class, while doing assignments, or while working due to smartphone use	Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree
3	Feeling pain in the wrists or at the back of the neck while using a smartphone	Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree
4	Won't be able to stand not having a smartphone	Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree
5	Feeling impatient and fretful when I am not holding my smartphone	Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree
6	Having my smartphone in my mind even when I am not using it	Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree
7	I will never give up using my smartphone even when my daily life is already greatly affected by it.	Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree
8	Constantly checking my smartphone so as not to miss conversations between other people on Twitter or Facebook	Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree
9	Using my smartphone longer than I had intended	Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree
10	The people around me tell me that I use my smartphone too much.	Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree

## 9.2 Rosenberg's Self-Esteem Scale

### Instructions

Below is a list of statements dealing with your general feelings about yourself. Please indicate how strongly you agree or disagree with each statement.

1. On the whole, I am satisfied with myself.

Strongly Agree, Agree, Disagree, Strongly Disagree

2. At times I think I am no good at all.

Strongly Agree, Agree, Disagree, Strongly Disagree

3. I feel that I have a number of good qualities.

Strongly Agree, Agree, Disagree, Strongly Disagree

4. I am able to do things as well as most other people.

Strongly Agree, Agree, Disagree, Strongly Disagree

5. I feel I do not have much to be proud of.

Strongly Agree, Agree, Disagree, Strongly Disagree

6. I certainly feel useless at times

Strongly Agree, Agree, Disagree, Strongly Disagree

7. I feel that I'm a person of worth, at least on an equal plane with others.

Strongly Agree, Agree, Disagree, Strongly Disagree

8. I wish I could have more respect for myself.

Strongly Agree, Agree, Disagree, Strongly Disagree

9. All in all, I am inclined to feel that I am a failure.

Strongly Agree, Agree, Disagree, Strongly Disagree

10. I take a positive attitude toward myself.

Strongly Agree, Agree, Disagree, Strongly Disagree

Scoring:

Items 2, 5, 6, 8, 9 are reverse scored. Give "Strongly Disagree" 1 point, "Disagree" 2 points, "Agree" 3 points, and "Strongly Agree" 4 points. Sum scores for all ten items. Keep scores on a continuous scale. Higher scores indicate higher self-esteem.

### 9.3 The Interaction Anxiousness Scale

(Leary, 1983)

Indicate how characteristic each of the following statements is of you according to the following scale:

1 = Not at all characteristic of me.

2 = Slightly characteristic of me.

3 = Moderately characteristic of me.

4 = Very characteristic of me.

5 = Extremely characteristic of me.

\_\_\_\_\_ 1. I often feel nervous even in casual get-togethers.

\_\_\_\_\_ 2. I usually feel comfortable when I'm in a group of people I don't know.

\_\_\_\_\_ 3. I am usually at ease when speaking to a member of the other sex.

\_\_\_\_\_ 4. I get nervous when I must talk to a teacher or a boss.

\_\_\_\_\_ 5. Parties often make me feel anxious and uncomfortable.

\_\_\_\_\_ 6. I am probably less shy in social interactions than most people.

\_\_\_\_\_ 7. I sometimes feel tense when talking to people of my own sex if I don't know them very well.

\_\_\_\_\_ 8. I would be nervous if I was being interviewed for a job.

\_\_\_\_\_ 9. I wish I had more confidence in social situations.

\_\_\_\_\_ 10. I seldom feel anxious in social situations.

\_\_\_\_\_ 11. In general, I am a shy person.

\_\_\_\_\_ 12. I often feel nervous when talking to an attractive member of the opposite sex.

\_\_\_\_\_ 13. I often feel nervous when calling someone I don't know very well on the telephone.

\_\_\_\_\_ 14. I get nervous when I speak to someone in a position of authority.

\_\_\_\_\_ 15. I usually feel relaxed around other people, even people who are quite different from me.