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The relationship between Nomophobia and: Age, Procrastination and Loneliness within an Irish population.

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Abstract

Aims: The objective of the current study is to provide a deeper understanding of nomophobia and it's possible predictive variables within an Irish sample. This study examined the potential predictive factors of loneliness and procrastination and whether they correlate with increased nomophobia levels. This study also examined what age group is most susceptible to increased levels of nomophobia. **Method:** A survey was administered to participators (*N*=171) through social media, which contained questions in relation to nomophobia, loneliness and procrastination. This was examined through the use of the nomophobia questionnaire (NMP-Q) (Yildirim & Correia 2015), the loneliness scale (UCLA) (Russell, 1996) and the irrational procrastination scale (Steel, 2010). **Results:** Results indicate that higher levels of procrastination, loneliness and Gen Z (participants between the age range of 18-26 years) were correlated with increased levels of nomophobia in the current study. **Conclusion:** Findings provide a deeper comprehension of nomophobia and it's possible contributing predictor variables. Importantly, findings challenge the assumption that only digital natives are effected by nomophobia.

Keywords: Nomophobia, Procrastination, Loneliness, Generational age differences.

Table of Contents

Introduction

The term nomophobia, which refers for "no-mobile-phone phobia", is defined as a condition of the modern day and is classified as the worry of being without access to a mobile phone (Olivencia-Carrión et al., 2018). It has become increasingly prevalent in today's society as a result of increased communications between individuals, as well as extensive access to information and platforms (Nagpal and Kaur, 2016; Tavolacci et al., 2015). The possession of our lightweight, portable devices comes with a variety of advantages, including simplified communication and global connectivity. With the aid of our phones we can share photos and videos as well as connect with friends and family through calls or texts, as well as being extremely useful in the case of an emergency (Smith et al., 2011). There is little that smartphones can't offer us, they have built-in cameras, alarm clocks, calendars, GPS, online banking, and much more. With the power to rapidly search anything, mobile phones offer an opportunity to educate and enhance ourselves through online research (Mehdipour & Zerehkafi, 2013). It also provides us with unrestricted access to games, videos, music, and social networking platforms, which can be used for entertainment purposes (Wei, 2008). However, despite their convenience, the continuous buildout of mobile phones is becoming a cause for concern, all sources are now available at the click of a button, consequently creating human dependency (Greengard, 2021). Although nomophobia/problematic phone use (PMPU) is not officially considered an addiction by the American Psychiatric Association, many researchers are referring to it as an increasingly problematic behavioural addiction (Billieux et al., 2015; Kuss, et al., 2018). This behaviour has been perceived as a propensity that enables its users feel compelled and compulsively consume it, imitating the impacts of addiction (Qaisar et al., 2017). Thus, the time spent, in addition to the nature of content individuals are exposed to through mobile phones can make it troublesome (Beranuy et al., 2009). Research suggests individuals spend

an average of 5 hours on their phones daily, exceeding the 2 hour daily recommendation that is considered healthy (Bittman et al., 2009; Zulkefly, & Baharudin, 2009). This phone overuse is suggested to have negative effects on an individual's life, with many studies focusing on the resulting effects nomophobia has on quality of life, often resulting in low levels of self-confidence, anxiety and depression (Panova et al., 2020; Jiang et al., 2022).

Rather than merely focusing on the resulting effects, it is equally important to investigate the increasing prevalence of nomophobia in today's society and understand what may be contributing to the severity of the issue. Some studies link nomophobia to particular personality attributes, mobile phone abuse is said to be related to extraversion, individuals who prefer to refocus their attention on the external world and obtain fulfilment in their nearby social and bodily environs (Bianchi and Phillips, 2005; Breckenridge, 2021),. as well as a range of mental ailments that include features of panic, melancholy, anxiousness, and obsessive-compulsive disorder (OCD) (Kuss et al., 2014; Lettieri, 2021),. and alexithymia, the failure to detect both their own feelings and those of others (Caffrey, 2019; Xiao et al., 2021). Several studies reveal a significantly positive association between problematic mobile phone use (PMPU), loneliness (Dayapoglu et al., 2016; Güzeller & Coşguner, 2012 ; Tan et al., 2013) and procrastination (Erdoğan et al., 2013; Hong et al., 2021). However, from the knowledge of the researcher, there is little to no research regarding the direction of the results, particularly with regards to procrastination and age. One study looks into academic procrastinators, and suggests those who repeatedly prolong learning-related responsibilities have increased chances of engaging in absorbing pursuits, a prime example being mobile phones due to their convenience and mobility (Hong et al., 2021). This may suggest procrastination is a predictive variable for PMPU, however the opposite resulting effects are also seen among studies. Based off existing literature, it could also be suspected that perhaps PMPU and or nomophobia could be a consequence of alexithymia, supressing feelings of

loneliness for example, and relying on mobile phone usage as a distraction or coping mechanism (Caffrey, 2019; Xiao et al., 2021). Findings from research demonstrate that alexithymia has a significant predictive influence on PMPU in teenage students, and that social interaction anxiety (SIA) and core self-evaluations (CSE) arbitrated the correlation among alexithymia and PMPU, and that a multitude of implicit trajectories were found. As a result, alexithymia can in cohort reduce CSE and elevate SIA to directly alter PMPU (Zhou et al., 2022). The purpose of this study is to establish whether levels of procrastination, loneliness and age are contributing factors to increased levels of nomophobia as well as investigating what generation is most susceptible to nomophobia.

Age as a predictive factor

There is plenty of research to suggest nomophobia is prevalent among younger people, particularly students and adolescence (Busayo et al., 2021; Gurbuz & Ozkan, 2020; Zou et al., 2019). This may be as a result of sample bias, as it could be assumed that younger people are more susceptible to nomophobia as mobile phones are becoming more prevalent in the developmental stages in recent years, compared with older generations (aka, digital native). However, technology is growing rapidly and is consistently used by a large variety of age groups due to its multifunction. One study suggests individuals in the 18–25 year-old age category portray the highest average Mobile Phone Problem Use Scale (MPPUS) scores and are most susceptible to nomophobia (Oviedo-Trespalacios et al., 2019). In contrast, a separate study found generation Y (individuals born between the years 1982 and 1996) has greater levels of PMPU than any other generation (Kuss, et al., 2018). Additionally, three separate studies found that individuals aged 55+ have very limited use for mobile phones and spend the least amount of time engaging online (Kurniawan, 2006; Kurniawan et al., 2006; O'bannon & Thomas 2014). Whereas two studies indicate that when participants are categorised by age groups, there is no noticeable significant variation in the degree of

nomophobia (Demirhan et al., 2016; Paray et al., 2020). These contradicting results may be a consequence of biased samples mainly targeting students, rather than the general population. There appears to be almost no research regarding the predictions of generational nomophobia. It is important to recognise the severity of this increasing issue in order to attempt prevention.

Loneliness as a predictive factor

One of the most universal emotions that people may encounter throughout their lives is loneliness (Bekhet et al., 2008). A gap between preferred and actual levels of social interactions leads to the negative experience of loneliness (Dewey, 2020). Research has found that female sex, spouseless, older aged, lower economic status, lower educational achievement, residing alone, poor interpersonal interactions, poor self-reported wellbeing, and poor functional ability are significant predictors of susceptibility to loneliness (Barreto et al., 2021; Gilmore & Cuskelly, 2014). Several of the above risk factors apply to older adults more so than younger people, this may account for reduced engagement in older adults mobile phone use, and may have influenced results in relation to age, had they been considered in more studies. Two studies found a substantial relationship among university students' levels of loneliness and their daily phone usage. The results showed that pupils with cell phone addiction scored higher on the loneliness scale than non-addicts (Öztunç, 2013; Dayapoglu et al., 2016). Suggesting one is either more likely to engage in excessive phone usage if they are experiencing symptoms of loneliness, thus relying on phones as a coping mechanism or a crutch. On the other hand, it could imply that individuals feel more lonely as a result of increased phone use. Additionally another study’s findings also imply that loneliness increases PMPU which limits in-person encounters while raising the requirement for social connection. However, the craving for social validation driven on by compulsive phone use is often unfulfilled, which inevitably results in increased loneliness (Kim, 2017).

Indicating there is a two-way relationship between loneliness and PMPU. Individuals who use their phones for three hours or more each day scored significantly higher on the loneliness scale than those who use them for less than an hour each day (Tan et al., 2013), highlighting the prevalence of loneliness as possible predictive factor for increased phone usage.

Procrastination as a predictive factor

According to research, procrastinating behaviour has a significant negative impact on people's physical health when work is not completed on time and deadlines are not met (Sirois & Pychyl,, 2013). As a result, increased stress and frustration are two common emotional effects an individual may experience (Cui et al., 2021). Procrastination is said to be more common among college students with more psychosocial health issues (Shi et al., 2019). Additionally, pupils with four psychosocial factors were around 2.5 times more likely to procrastinate than students without syndetic difficulties (Shi et al., 2019). It is additionally reported that male students procrastinate more often, and are therefore more sensitive to the adverse effects of doing so on their student achievement and degree of educational life satisfaction (Balkis & Erdinç, 2017). It is estimated that roughly 20–25% of adult males and females worldwide engage in persistent procrastination in a variety of contexts, including educational, interpersonal, occupational, and financial management (Heath & Anderson, 2010). One study looks into sleep procrastination as a result of excessive phone usage which found significant bidirectional links between sleep quality with before-bed procrastination and symptoms of depression (Cui et al., 2021). People who check their phones more frequently may be more susceptible to procrastination as a result of disruptions from phone alerts every day. Furthermore, procrastination is significantly linked with both reported disruptions and the temptation to check them (Meier, 2022). This may indicate that nomophobia may stem from increased quantities of alerts. Furthermore, dopamine is released

by our brains when we perform an activity that satisfies a survival demand. Dopamine is a "feel-good" hormone that naturally occurs and stimulates our internal rewards system. When we receive likes, comments, or other notifications on social media, it resembles said activity and releases dopamine (Burhan & Moradzadeh, 2020). Numerous studies have revealed that using a phone enhances dopamine levels in our brains, which temporarily boosts our mood but also influences compulsive behaviour (Karppi et al., 2021). Highlighting a possible connection between why mobile phones could be frequently used to procrastinate. Research conducted in cross-sections have shown a correlation between PMPU and academic procrastination. The precise predictive direction has, however, remains uncertain, and the probable pathways behind the relationship have not undergone a detailed analysis (Qaisar et al., 2017). The high mood individuals receive from dopamine is considered a contributing factor as to why PMPU is becoming a behavioural addiction. This in combination with alexithymia could potentially predict procrastination as a contributing factor to nomophobia. Throughout the duration of this research, we aim to fill the directional gap in the literature.

Rationale

Many studies focus on the resulting effects nomophobia has on an individual's quality of life, often resulting in low levels of self-esteem, anxiety and depression (Panova et al., 2020). In contrast this research hopes to close a void in the literature by identifying the relationship between excessive phone usage/nomophobia, and its potential contributing factors. It is beneficial to develop a greater apprehension of nomophobia in today's world and recognise what may be conducive to the severity of the issue. This study will aim to corroborate whether levels of procrastination, loneliness and age are contributing factors to increased levels of nomophobia. Additionally, it will attempt to confirm whether levels of nomophobia differ between generations. Majority of research conducted in relation to nomophobia focuses on the aftermath that PMPU can have on a person's quality of life, with

less focus on potentially predictive variables. If we can identify predictive variables for nomophobia, this may give us more information about potential causes and relationships between risk factor variables. Most studies that relate nomophobia and loneliness have a limited age range and population, as they deal with adolescence or students from restricted institutions. Whereas this study will be inclusive of all non-vulnerable age ranges, as well as focusing on an Irish population, which there is little to no research on in this area. As previously discussed, it is suggested that loneliness is a two-directional variable and may be both the cause and extended result of PMPU. On the other hand there is a lot of research with regards to procrastination as a result of excessive phone usage, however it remains unknown whether there is a definite directional correlation between the two variables. The current study aims to challenge whether procrastination might not necessarily only be a consequence, and instead a predictor. In other words, do people depend on phones to escape their undesired tasks or emotions, rather than the reverse.

Hypotheses

Research question 1: Is there a relationship between levels of loneliness and nomophobia? Hypothesis for research question 1: Higher levels of loneliness will predict increased levels of nomophobia/problematic mobile phone uses (PMPU).

Research question 2: How do levels of procrastination correlate with nomophobia? Hypothesis for research question 2: Higher levels of procrastination will predict increased levels of nomophobia/problematic mobile phone uses (PMPU).

Research question 3: What age range shows the highest rates of nomophobia? Hypothesis for research question 3: Generation Z will have higher levels of nomophobia than generations X & Y.

Methods

Participants

The sample within the present study has a total of 171 respondents (*N*=171). The minimal sample size was determined using Tabachnick and Fidell's (2013) method, which involves considering the quantity of independent variables that the researcher hopes to use: *N* > 50 = 8M, where M represents the total amount of predictor variables. Consequently, the minimum sample size for this analysis was *N* = 74. Online self-reported anonymised questionnaires were employed to collect the data. Using convenience sampling, volunteers were gathered through the access of the researcher's profiles on Facebook, Instagram, and Whatsapp. This ensured that the sample would be composed of active mobile phone users, contributing to more credible findings for the research topic. Participants were also able to distribute the link to any additional individuals they considered to be suitable. In keeping with moral requirements, individuals had to be a minimum of 18 years old to participate. Furthermore, prior to the commencement of the questionnaire, each participant was obliged to provide informed consent; nevertheless, no incentives were employed to entice individuals to give their consent. Thus further, the overall sample consisted of 171 participants (77 males and 94 females). With an average age of 29 years (SD = 14.71) with a range of 18 to 72 years.

Measures

Demographics: Respondents were instructed to state their age in years and their gender (male, female, or other). The average daily screen time of the participants was also requested, and they were cautioned to read the questions attentively before submitting (Appendix 4).

Nomophobia Questionnaire - The Nomophobia Questionnaire (NMP-Q) (Yildirim & Correia 2015) was used to measure levels of nomophobia/screen fixation. Example questions from the scale include: “running out of battery on my smartphone would scare me” and “If I could not check my smartphone for a while, I would feel a desire to check it”. Each of the 20 questions on the NMP-Q is graded on a 7-point Likert scale ranging from 1 “strongly disagree” to 7 “strongly agree”. The NMP-total Q's score ranges from 20 at its lowest (20 * 1) to 140 at its maximum (7 * 20). A score of 20 indicates an absence of nomophobia, 21-59 refers to a mild level of nomophobia, 60-99 is considered a moderate level and 100-140 suggests severe nomophobia (Yildirim & Correia, 2015). According to studies, those who perform well on the test have a tendency to avoid in-person contacts, have high levels of social anxiety, and may even be depressed. Cronbach's alpha for numerous samples are typically within the range of .88 to .95 (see Adawi et al., 2018 for further detail). This scale proved good reliability within the present study ($\alpha = .95$). NMP-Q scores generate dependable results and has strong internal consistency (Yildirim & Correia, 2015). (Appendix 5).

Loneliness Scale: The Loneliness Scale (UCLA) (Russell, 1996) was used to measure levels of loneliness, consisting of 20 items that gauge how frequently a person feels isolated. Participants respond to 20 questions, such as "How frequently do you feel left out," using a 4-point rating scale (1 = never; 4 = always). After the positively worded items are reverse-coded such that higher levels indicate increased loneliness, each participant's score is calculated by averaging their scores. For this scale Q1, Q5, Q6, Q9, Q10, Q15, Q16, Q19, and Q20 must be reverse-scored. Items that generate a reverse score have terminology that conflicts with the scale's direction of measurement. The method for reverse-scoring an item is: (Number of scale points) + 1) - (Respondent’s answer) For example, Q1 is a 4-item scale. If a participant selects 3 on Q1, their answer would be re-coded as (4 + 1) - 3 = 2. In other

words, you would enter a 2 for this participants answer to Q1 rather than 3. To calculate the final score for each respondent, you sum up all answers for a score ranging between 20 and 80. Increased scores suggest higher levels of loneliness. The most common categorization used is as followed: 20–34 indicates a low level of loneliness, 35–49 a moderate level of loneliness, 50–64 a moderately high level of loneliness, and 65–80 a high level of loneliness. Cronbach's alpha for numerous samples are typically within the range of .89 to .94 (see Antonacopoulos & Pychyl, 2010 for further detail). This scale proved good reliability within the present study (α = .94). Coincident, prospective, and logical validity are all confirmed by the scale (Russell (1996) (Appendix 6).

The Irrational procrastination scale. The Irrational procrastination scale (IPS) (Steel, 2010) consists of 9 items which are rated on a 5-point Likert scale (1 = Very seldom or not true of me; 5 = Very often true or true of me), with higher scores indicating higher levels of irrational procrastination. Questions 2, 5 and 8 will be reversed scored, taking the same format at UCLA above. Any score 23 or below suggests an individual is in the bottom 10–25%, which indicates little to no procrastination. A score of 24–31 means an individual is in the middle 50%, which refers to average procrastination. A score of 32–36 is in the top 10–25%, and a score of 37 or more means you are in the top 10% which suggests high, problematic levels of procrastination. Example questions include: ‘I do everything when it needs to be done’ and ‘I spend my time wisely’. Cronbach's alpha for numerous samples are typically within the range of .89 to .94 (see Steel, 2010 for further detail). This scale proved good reliability within the present study (α = .87). The IPS items had adept reliability, successful content validity, internal validity, and meaningful validity (Shaw & Zhang, 2021) (Appendix 7).

Design and analyses

The present study's research design is cross-sectional since all of the data was gathered at only one time point. Moreover, it is quantitative in structure, the study employed questionnaires to collect its data. The first and second hypotheses were analysed using Pearson's correlations. 1) How do levels of loneliness correlate with nomophobia?. 2) How do levels of procrastination correlate with nomophobia?. The third hypothesis was evaluated using a cross tabulation table. 3) which generation is most susceptible to nomophobia. Age being the predictor variable (PV), while nomophobia was the criterion variable (CV) in this case.

Procedure

Online data was obtained using a Google Forms survey. The survey was initially piloted with three members to measure its duration and ensure that no concerns surfaced. The assessment averaged a time of 9 minutes to complete, and no complications were detected. Their material was not included in the analysis. The survey was then published online and the participation information sheet was modified to reflect that it is estimated that the survey would take 10 minutes to finish. The survey along with its eligibility requirements were uploaded on the social media sites Instagram, Facebook and WhatsApp, anyone who was interested in taking part was prompted to click the link. An information sheet for respondents on the study's purpose and scope, as well as the author, institution, and supervisor was incorporated into the survey's introductory page (see Appendix 1). The respondents were informed that completing participation in the research was purely voluntary and that they may revoke their assent at any stage prior to submission without incurring any repercussions. The lone constraint was that reports could not be retracted following submission since they would no longer be traceable to the individual. The Consent form, located on the following page of the survey, again detailed the study's purpose and

required them to tick the consent box before they could commence to the questionnaires (see Appendix 2). Respondents had to declare that they were at least 18 years old and that they were prepared to willingly engage in the research in order to continue with the survey. On the following page, demographic questions including participants age, gender, and screen time were requested (see Appendix 4). The survey was then presented in the following sequence; The Nomophobia Questionnaire (see Appendix 5), The Loneliness scale (see Appendix 6), The procrastination quotient (see Appendix 7). A supplemental Debriefing Form clarifying the study's purpose and acknowledging and thanking respondents for their participation was included on the survey's closing page (see Appendix 3). Upon that page, numerous helplines were additionally listed in case any survey questions caused respondents any psychological discomfort.

This research project was authorised by The National College of Ireland's Ethics Committee, and it adheres with both the NCI Ethical Guidelines as well as the Code of Professional Ethics of the Psychological Society of Ireland. Although it was envisaged that no apparent harm would arise from this study, the debriefing sheet contained helplines should any respondents be emotionally affected by the content.

Results

Descriptive Statistics

The current data is taken from an Irish sample of 171 participants (*N*=171) which comprised of 55% females (*n*=94) and 45% males (*n*= 77). Descriptive statistics were performed for both categorical and continuous variables. Continuous variables include nomophobia, loneliness, procrastination and age. Means (M), Standard Deviations (SD), Medians (MD), and Range were acquired, as well as tests of normality. Preliminary analysis was performed on the data set which indicated that all continuous variables followed the assumptions of normality. The results for all continuous variables are reported below in table 1.

Table 1: *Descriptive statistics for all continuous variables,* (*N*=171)

	M [95% CI]	*Median*	*SD*	Range
Age	28.85	21	14.71	59
Loneliness score	46.36	46	3.33	17
Procrastination score	29.83	30	7.29	34
Nomophobia score	80	80	25.17	120

Categorical variables included gender and screen time. Frequency and Valid %, were acquired, in conjunction with tests of normality. The results for all categorical variables are presented below in table 2.

Table 2: *Descriptive statistics for categorical variables,* (*N*=171)

Variable		Frequency	Valid %
Gender	Male	77	45
	Female	94	55
Screen Time	1-2	16	9.4
	2-3	30	17.5
	3-4	31	18.1
	4-5	34	19.9
	5-6	32	18.7
	6+	28	16.4

Inferential statistics

A Pearson's correlation coefficient was computed to assess the relationship between screen time and nomophobia. Preliminary analysis were conducted to ensure no violation of the assumptions of normality, linearity and homoscedasticity. There was a significant, moderate, positive correlation between screen time and nomophobia ($r = .339$, $N = 171$, $p < .001$). Results indicate that higher levels screen time are associated with higher levels of nomophobia, therefore the two variables are somewhat dependent on each other (See Table 3).

A Pearson's correlation coefficient was conducted to assess the relationship between loneliness and nomophobia. Preliminary analysis were conducted to ensure no violation of the assumptions of normality, linearity and homoscedasticity. There was a significant, weak, positive correlation between loneliness (L score) and nomophobia (N score) ($r = .242$, $N = 171$, $p = <.001$). Furthermore, 1 unit increase in L score will result to .242 unit increase in N score. Results indicate that loneliness and nomophobia are correlated and statistically significant, therefore with an increase of loneliness there is an increase of nomophobia, meaning the two variables are somewhat dependent on one another (See Table 3).

A Pearson's correlation coefficient was conducted to assess the relationship between procrastination and nomophobia. Preliminary analysis were conducted to ensure no violation of the assumptions of normality, linearity and homoscedasticity. There was a significant, moderate, positive correlation between procrastination (P score) and nomophobia (N score) ($r = .313$, $N = 171$, $p < .001$). Furthermore, 1 unit increase in P score will result to .313 unit increase in N score. Results indicate that procrastination and nomophobia are correlated and statistically significant, therefore with an increase of procrastination there is an increase of nomophobia, meaning the two variables are somewhat dependent on one another (See Table 3).

Table 3: *Pearson's correlations between continuous variables*

variables	1	2	*3*	*4*	*5*
1. Screen time	1				
2. Nomophobia score	.339	1			
3. Procrastination score	.243	0.313	1		
4. Loneliness score	.174	.242	.423	1	

A crosstabulation frequency table was created to determine which generation portrays the highest levels of nomophobia. For the purpose of this study, the generations are categorised as followed; Gen Z; 18-26 years, Gen Y; 27-40 years, Gen X; 40< years. With overall participants (*N*=171) 61% of participants were from Gen Z, 17% from Gen Y and 22% from Gen X. The percentage range from each degree of nomophobia was calculated relative to each generation (see table 5). The correlations between the predictor variables (PV) and criterion variable (CV) included in the model were examined. The PV (age) was significantly correlated with the CV, nomophobia (see table 4). The results showed that Gen Z shows the highest nomophobia levels with 62 individuals with moderate and 31 with severe nomophobia.

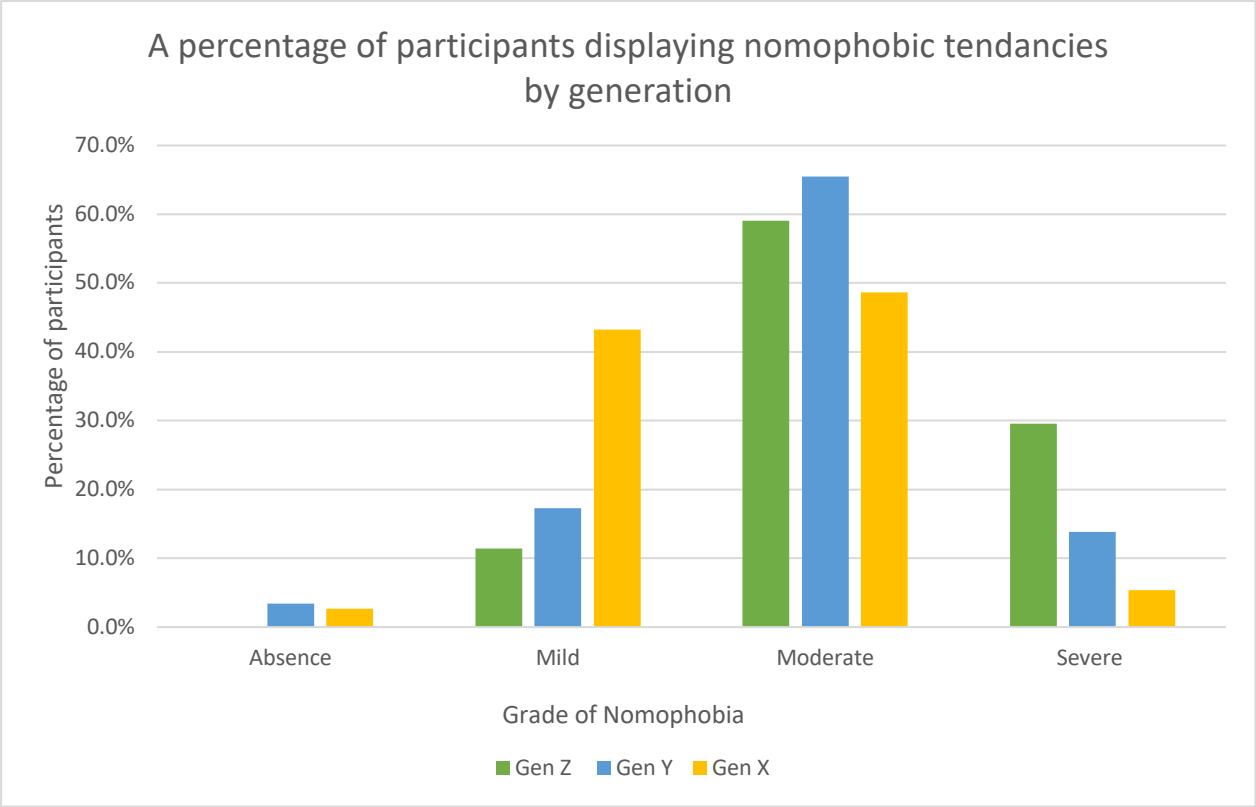
Table 4: *Cross tabulation table between continuous variables, separated by generation and degree of nomophobia.*

	Absence	Mild	Moderate	Severe	Total
Gen Z	0	12	62	31	105
Gen Y	1	5	19	4	29
Gen X	1	16	18	2	37
Total	2	33	99	37	171

Table 5: *A percentage calculated relative to the number of participants from each generation, as well as the total percentage of nomophobia in the overall test group.*

	Absence	Mild	Moderate	Severe
Gen Z	0.0%	11.4%	59.0%	29.5%
Gen Y	3.4%	17.2%	65.5%	13.8%
Gen X	2.7%	43.2%	48.6%	5.4%
Total	1.2%	19.3%	57.9%	21.6%

Figure 1: *Bar chart of nomophobia among generations*



Discussion

The current study aimed to investigate the relationship between nomophobia and its potential predictive factors within an Irish context, in hopes to provide a greater understanding of nomophobia and what may contribute to increased levels. Within the current study, the following predictor variables were analysed; loneliness, procrastination and age. It also aimed to investigate what generation is most susceptible to increased nomophobia levels.

Prior findings have suggested that younger individuals are a digital native generation and are more prone to developing nomophobia, as they are a step ahead in using these technologies than other groups of people (Gurbuz & Ozkan, 2020; Hasmawati et al., 2020). Further research reveal younger generations experience the highest levels of nomophobia, though they suggest every individual who possesses a smartphone demonstrates some degree of nomophobia. (Setia & Tiwari, 2021). One study's results demonstrated a significant favourable connection amongst nomophobia and loneliness, as well as other distressing emotions (Dahiya, 2021). Additionally, the results of a study on the interaction between nomophobia and loneliness, revealed that, to some degree, loneliness may be used to predict nomophobia levels among adolescence (Gezgin et al., 2018). With regards to procrastination, research found a marginally significant link between procrastination and multiple screen addiction (MSA), including mobile phones (Gökalp et al., 2022). Indicating that procrastination may arise if someone engages in behaviours they prefer, such as checking social media, while intentionally delaying other more critical or challenging tasks (Reinecke et al., 2014). This is in accordance with Geng et al., (2018) findings, as well as a substantial collection of data revealing that media consumption (Lavoie & Pychyl, 2001; Reinecke & Hofmann, 2016), internet usage (Reinecke et al., 2018; Yang et al., 2019), and mobile phones are all typical methods of procrastination.

It was hypothesized, from previous research, that (H1) higher levels of loneliness will predict increased levels of nomophobia/problematic mobile phone uses (PMPU). Utilising a Pearson's correlation it was investigated whether our PV in question, loneliness was dependant on our CV Nomophobia or not. From which results found a significant weak, positive association with loneliness and nomophobia, these findings suggest that high levels of loneliness were associated with slight increase in nomophobia levels. This is in accordance with numerous studies which have also found a correlation between increased loneliness and nomophobia (Dahiya, 2021; Dayapoglu et al., 2016; Gezgin et al., 2018; Öztunç, 2013), which implies that individuals are more inclined to use their phones excessively if they are undergoing feelings of loneliness.

It was further hypothesised (H2), higher levels of procrastination will predict increased levels of nomophobia/problematic mobile phone use (PMPU). This was explored using a Pearson correlation analysis; from which a significant moderate, positive association with procrastination and nomophobia was found, these findings suggest that high levels of procrastination were associated with increased nomophobia. This is in accordance with numerous studies which have also found a correlation between increased procrastination and nomophobia (Cui et al., 2021; Geng et al., 2018; Gökalp et al., 2022).

Lastly, H3 stated Generation Z individuals will have higher levels of nomophobia than generations X & Y. Age differences were investigated with relation to the extent that each group scored on the NMP-Q, providing their nomophobia levels. In support of hypothesis 3, results from a cross-tabulation showed that Gen Z scored the highest rates of nomophobia with a total of 29.5% with sever nomophobia, compared with 13.8% in Gen Y and 5.4% in Gen X. Which shows younger people may be more susceptible to developing nomophobia in comparison with older generations Y and X. This both correlates with prior research which suggests younger age groups are most susceptible to nomophobia (Gurbuz &

Ozkan, 2020; Hasmawati et al., 2020; Oviedo-Trespalacios et al., 2019). Though it contradicts literature which found no variance in relation to age and nomophobia levels (Demirhan et al., 2016; Paray et al., 2020). Based of the relevant findings, we can accept hypothesis 1, 2 & 3.

It is apparent from our findings that only 9.4% of the sample from the current study have a healthy recommended screen time of 2 hours or less (Bittman et al., 2009; Zulkefly, & Baharudin, 2009). Furthermore, 35.1% spent over 5 hours on their phones daily. The correlations between screen time and various health-related behaviours and consequences were examined. Results revealed screen consumption has been related to harmful dietary behaviours, skipping classes, alcoholism, and reduced physical exercise (Busch et al., 2013). Screen time consumption and misuse were additionally linked to a variety of psychological issues as well as adiposity (Busch et al., 2013). This is a cause for concern given the small proportion of participants within the healthy recommended limit. Additionally only 1.2% of all participants met the criteria for absence of nomophobia in comparison to 79.5% of respondents in the category of moderate to severe nomophobia. These findings correlate with the work of Setia & Tiwari, (2021), who suggest 100% of the population in possession of a mobile phone is nomophobic to some degree. The indicators and symptoms of nomophobia include shaking, sweating, irritation, anxiousness, respiratory difficulties, and tachycardia. The convolution of the disorder is heightened by the fact that nomophobia shares several clinical symptoms with other conditions, making it more onerous to diagnose and may subsequently be overlooked (Bhattacharya et al., 2019). This reinforces how crucial it is to remain vigilant on our screen time and to be conscious of the consequences of PMPU.

Procrastination and loneliness were the two predictor variables for nomophobia in the current study. In accordance with existing literature, procrastination was significantly positively correlated with nomophobia (Gökalp et al., 2022; Meier, 2022). Given frequent

interruptions from phone notifications, those who check their phones more regularly may put off other tasks (Meier, 2022). This is consistent with the results of the present study, which indicate increased procrastination scores correlate with increased nomophobia scores. On the other hand it may be compatible with research that suggests the relationship between procrastination and nomophobia may be bidirectional and may be a predictive or resulting factor (Qaisar et al., 2017). It may be beneficial for future research to undergo a more detailed analysis on the definitive direction of the relationship.

Additionally, the PV of loneliness was also found to be significantly positively correlated with nomophobia scores. According to a report published by Bian & Leung (2014), mobile phones give consumers the opportunity to circumvent audible or face-to-face interaction, avoiding unfavourable social situations. On that basis, he argued that the decrease in physical interactions as a result of excessive smartphone use may correlate with loneliness (Dahiya, 2021). Furthermore, a rise in social phobia, which includes nomophobia, could represent a significant component to loneliness in recent times. Hence it was hypothesised that there may be a positive relationship between increased loneliness and nomophobia levels.

Several studies have investigated nomophobia with a focus on adolescence and college students (Kaur et al., 2021; Gezgin, 2017; Özdemir et al., 2018). The current study includes a wide variety of age groups, ranging from 18 to 72, it is important not to disregard older generations simply because they are not deemed as digital natives. The so-called "digital native generation" was raised in the digital world and has grown up using gadgets, notably smartphones (Hasmawati et al., 2020). Irrespective of this, further research has concluded that there are variations in nomophobia amongst generations X, Y, and Z (Khairani et al., 2022) therefore, it is unjust to exclude older age groups in ongoing research. Perhaps it is not that generations X & Y have decreased nomophobia levels compared with

Gen Z, but instead suffer from different effects that are not accurately measured by the NMP-Q, which is generally used more in studies with younger age groups. This could be a question of interest considering only 21% of the current sample consisted of individuals in Gen X (40 years <) and 54% of those indicate moderate to severe nomophobia. Future research would benefit from investigating the possible differences in more depth and confirming the reliability of the NMP-Q in representation of all ages. Longitudinal research would also be of benefit to determine whether nomophobia levels will increase among generations in the years to come.

Strengths & Limitations

A strength within the present study includes the effort to build on past research in a novel approach. To the best knowledge of the researcher, earlier studies have disregarded emphasis on nomophobia's predictive factors and instead have merely investigated the effects. Additionally, many other studies include a reduced age range and centre attention around younger people, where the current study compared younger and older age categories to establish generational differences. Another strength is the study's proportionate representation of males and females (45% and 55%, respectively). There was no gender variations in the irrational procrastination scale (IPS) total scores in the present study, whereas substantial research has indicated that males procrastinate more than females in larger scale studies (e.g., Steel and Ferrari, 2013). Consequently, research with a larger gender disparity should be wary when presenting their results, and it is advisable to examine any suspected gender inequality on the IPS further. However, there remains a variety of limitations within the current study that need to be taken into consideration.

Firstly, no causality can be deduced within this study as it is cross-sectional in design. Future longitudinal research may be able to more effectively develop on research question 3, and assess whether nomophobia is an increasing generational issue. Nomophobia levels may

vary throughout generations, from timepoint A to timepoint B, which would be evident in a longitudinal study. In other words, Gen Z may report higher levels of nomophobia in the years to come compared with what older generations Y & X are reporting now. This would suggest nomophobia will become more prominent in years to come.

Secondly, each of the scales used self-reported measurements. Despite being anonymised, some respondents might have felt self-conscious or in doubt of the extent to which they compulsively utilise their phones. This may additionally apply to the confidential nature of the predictive variables of both procrastination and loneliness. When using self-report measures, the data is vulnerable to self-selecting biases, which implies that responses might have been affected with regards to how the respondents felt while completing the questionnaires, rather than how they generally felt about the elements being assessed. With the use of an implicit association test to assess the predictive and criterion variables in future research may be beneficial, since they could be more illuminating of any inherent biases.

Thirdly, there was a lower quantity of participants in Gen Y and X compared with Gen Z collected in this study. The current sample consisted of 105 (61.4%) Gen Z respondents compared with 29 (17%) Gen Y and 37 (21.6%) Gen X respondents. As previous research has highlighted contradicting results, one being that younger generations are most susceptible to nomophobia where others report no significant difference. Perhaps a sample with a more equally balanced age demographic would have resulted in different outcomes, than those proposed in the current study.

Lastly, the scarcity of prior research on the relevant predictor factors poses a challenge for us to generate a comprehensive discussion about it, yet it additionally emphasises the novel nature of the current study. It would be imperative to further evaluate the predictive factors of nomophobia in order to attempt prevention or at least hinder the severity of the growing issue.

Conclusion

Overall, there is congruous support that age and procrastination are related with nomophobia. Our study both strengthens the existing body of previous literature and builds on prior findings. The stated frequency of nomophobia (to some extent) in 98.8% of the current Irish sample is worrisome. Nomophobia has been associated with an array of emotional and physical health complications and can have an influence on youth development in numerous ways. The findings of this research provides a foundation for further investigation into nomophobia and other predictive variables. It calls attention to the risks of PMPU, which, both independently and in conjunction with certain personal attributes, may favour the emergence of adverse results. As a result, both sensitivity and resilience are relevant variables that must be taken into account in ongoing studies. To conclude, recognition of the risk/predictor variables for nomophobia and the identification of those that provide a preventive action are essential from the standpoint of poor mental health as a consequence of PMPU.

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Appendices

Appendix 1

Participant Information Leaflet

The relationship between Nomophobia and: Age, Procrastination and Loneliness within an Irish population.

You have been asked to participate in a research project. I respectfully request that you read this material thoroughly before deciding whether or not you would like to participate. This leaflet describes what the research entails and the contribution of your participation. Please contact me using the information provided at the end of this paper if you have any queries about this document or the research study.

What is the question of interest?

I am a psychology student in my final year at the National College of Ireland. A research project completed independently is a significant aspect of our degree, which is why you are being requested to participate in this study. I want to investigate the reasoning behind excessive mobile phone use and whether age, loneliness and/or procrastination are contributing factors to increasing levels of nomophobia.

Dr. Conor Nolan, one of the lecturers at the National College of Ireland, is the project's supervisor.

What will participation in the study involve?

Participants will be asked to fill in an online questionnaire if you choose to participate in this research study. The survey will require participants to fill out questionnaires relating to nomophobia (NMP-Q) (this section will take between 2-3 minutes to complete) Loneliness (UCLA) (approx. 1.5 to 2.5 minutes to complete) and procrastination (IPS) (approx. 1.5-2.5 minutes to complete) (approx. 6.5 minutes overall). Participants will receive a digital copy of the above questionnaires. It should take no more than 15 minutes to finish both reading of the information sheet & consent form and fill out the three questionnaires.

Is participation compulsory?

Participation in this study is entirely voluntary, and consent can be revoked at any time prior to submission. Participants also have the opportunity to refuse to answer any question without penalty. Loneliness and nomophobia are two topics on this survey that may make some people uncomfortable. We recommend not to participate in this study if you are sensitive to these topics.

What are the risks and benefits of participating?

Participating in this study will provide you with no direct or personal rewards. However, the data supplied will aid future research into the knowledge of nomophobia and its potential contributing/risk factors. Certain items in the questionnaire may cause minor distress to some participants as they deal with subjects of loneliness and nomophobia. Please do not participate in this survey if you are concerned that it may cause you any form of distress. However, if you experience any of these issues during or after the survey, you can stop at any moment and contact the researcher for assistance.

Will my participation be kept private, and what will happen to my data?

All information gathered for this study is kept completely anonymous. Any information submitted in the questionnaire that can be used to identify the participant or another person (for example, addresses and names) will be anonymise. The information gathered by the questionnaire is only available to the researcher and academic supervisor. If the researcher or academic supervisor believes you or another individual is in danger or at risk, they must disclose it to the authorities. This will be communicated to the subjects in advance.

What will happen to the study's findings?

The findings of this research will be in my dissertation in my final year, which will be submitted to NCI.

For more information, who should you contact?

Researcher:

Name: Ellen O'Hare Email: x20484974@student.ncirl.ie

Academic supervisor:

Name: Dr. Conor Nolan Email: conor.nolan@ncirl.ie

Appendix 2

Consent form

The relationship between Nomophobia and: Age, Procrastination and Loneliness within an Irish population.

- I _____ agree to participate in this research study as a volunteer.
- It has been conveyed to me, and I understand that I have the right to withdraw my consent at any moment prior to submission. I am also aware that I am under no obligation to respond to any element of this study and that there will be no consequences if I do not.
- I consent to my information being kept on file until the examination board has confirmed the researcher's findings.
- I understand that I have the right to view my information at any time while it is still on file under the Freedom of Information Act.
- The purpose of this study and how it will be carried out was described to me in writing, and I was given the opportunity to ask any questions and voice any concerns I might have.
- I accept that this research will not benefit me personally.
- I realize that I will be asked questions regarding nomophobia, loneliness and procrastination as part of my participation. I understand that I must answer these questions as honestly as possible.
- I accept that any information gathered for this study is private and will be treated as such.
- I accept that my identity will be kept totally confidential in any written or audio report resulting from this research. This will be accomplished by modifying names and any other facts of identity that may be discussed.
- My responses to the questionnaire questions may be used in research or presentations, but they will remain anonymous.
- I realize that if I state that myself or another person is in danger, they may be obligated by law to disclose the situation to authorities; therefore, my approval is not required, but it will be discussed with me before-hand.
- I accept that I can contact any of the study's participants at any time to ask questions and acquire further information if I so desire.

Researcher: Ellen O'Hare

Contact: x20484974@student.ncirl,ie

Signature of research participant: _____ Date:_____

Signature of researcher:_____ Date:_____

Appendix 3

Participant Debriefing Sheet

The relationship between Nomophobia and: Age, Procrastination and Loneliness within an Irish population.

First and foremost, we want to convey our appreciation for taking the time to engage in this research. Thank you again for contributing; your data will aid in the formulation of my dissertation and will help to enrich the scientific literature around aspects of nomophobia, loneliness and procrastination.

What is the research in question?

The following study is investigating the link between Nomophobia and contributing factors. More precisely, we want to find out whether age, loneliness and/or procrastination contribute to levels of nomophobia and whether this is an increasing generational issue. We'd like to emphasize that this was an observational study, and participating in it has no bearing on whether or not you have nomophobia concerns.

How will my data be used?

On the self-report scales you filled out, your data will be adjusted, and the findings will be transmitted to a statistical software called SPSS. We'll look for any patterns or substantial discrepancies between the three variables in question, loneliness, procrastination age or our CV, excessive phone use/nomophobia in this section. The findings of this study will be included in the researcher's final dissertation for the National College of Ireland, and they may be submitted to a scientific journal in the future.

Is Anonymity of data?

The present study will take a completely anonymous, self-reported approach and no personal data will be collected from any participant.

Useful contact information:

Please contact the following if you have any additional questions about the study, its processes, or information about your data:
Researcher: Ellen O'Hare
Email: X20484974@student.ncirl.ie
Supervisor: Dr Conor Nolan
Email: Conor.Nolan@ncirl.ie

Freely available helplines:
Please utilize the attached helplines if you are disturbed or distressed after completing the study and want to speak to someone other than the researcher or supervisor.

Talk to Tom: 0818 303 061
Pieta House: 1800 804 848

24/7 Mental health support: text "HELLO" to 50808

Appendix 4

Demographic data

1)What is your gender?

2)What is your age?

3)What is your ‘daily average screen time’?

Please refer to ‘screen time’ in your settings app.

Appendix 5

Nomophobia Questionnaire (NMP-Q)

Nomophobia Questionnaire (NMP-Q)

Please indicate how much you agree or disagree with each statement in relation to your smartphone.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

1. I would feel uncomfortable without constant access to information through my smartphone.
2. I would be annoyed if I could not look information up on my smartphone when I wanted to do so.
3. Being unable to get the news (e.g., happenings, weather, etc.) on my smartphone would make me nervous.
4. I would be annoyed if I could not use my smartphone and/or its capabilities when I wanted to do so.
5. Running out of battery in my smartphone would scare me.
6. If I were to run out of credits or hit my monthly data limit, I would panic.
7. If I did not have a data signal or could not connect to Wi-Fi, then I would constantly check to see if I had a signal or could find a Wi-Fi network.
8. If I could not use my smartphone, I would be afraid of getting stranded somewhere.
9. If I could not check my smartphone for a while, I would feel a desire to check it.
10. If I did not have my smartphone with me, I would feel anxious because I could not instantly communicate with my family and/or friends.
11. If I did not have my smartphone with me, I would be worried because my family and/or friends could not reach me.
12. If I did not have my smartphone with me, I would feel nervous because I would not be able to receive text messages and calls.
13. If I did not have my smartphone with me, I would be anxious because I could not keep in touch with my family and/or friends.
14. If I did not have my smartphone with me, I would be nervous because I could not know if someone had tried to get a hold of me.
15. If I did not have my smartphone with me, I would feel anxious because my constant connection to my family and friends would be broken.
16. If I did not have my smartphone with me, I would be nervous because I would be disconnected from my online identity.
17. If I did not have my smartphone with me, I would be uncomfortable because I could not stay up-to-date with social media and online networks.
18. If I did not have my smartphone with me, I would feel awkward because I could not check my notifications for updates from my connections and online networks.
19. If I did not have my smartphone with me, I would feel anxious because I could not check my email messages.
20. If I did not have my smartphone with me, I would feel weird because I would not know what to do.

Yildirim & Correia (2015)

Rate your responses on a scale of 1 (completely disagree) to 7 (strongly agree) and add your score. According to Caglar Yildirim, a score of 20 or below means you're not an addict; a score of 21 to 60 means you're mildly nomophobic; and a score of 61 to 99 means you probably can't go long without checking your phone.

Appendix 6

UCLA LONELINESS SCALE

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

C indicates "I often feel this way"
S indicates "I sometimes feel this way"
R indicates "I rarely feel this way"
N indicates "I never feel this way"

1.	I am unhappy doing so many things alone	O S R N
2.	I have nobody to talk to	O S R N
3.	I cannot tolerate being so alone	O S R N
4.	I lack companionship	O S R N
5.	I feel as if nobody really understands me	O S R N
6.	I find myself waiting for people to call or write	O S R N
7.	There is no one I can turn to	O S R N
8.	I am no longer close to anyone	O S R N
9.	My interests and ideas are not shared by those around me	O S R N
10.	I feel left out	O S R N
11.	I feel completely alone	O S R N
12.	I am unable to reach out and communicate with those around me	O S R N
13.	My social relationships are superficial	O S R N
14.	I feel starved for company	O S R N
15.	No one really knows me well	O S R N
16.	I feel isolated from others	O S R N
17.	I am unhappy being so withdrawn	O S R N
18.	It is difficult for me to make friends	O S R N
19.	I feel shut out and excluded by others	O S R N
20.	People are around me but not with me	O S R N

Scoring:

Make all O's =3, all S's =2, all R's =1, and all N's =0. Keep scoring continuous.

Self Report Measures for Love and Compassion Research: *Loneliness and Interpersonal Problems* Fetzer Institute

A 20-item scale designed to measure one's subjective feelings of loneliness as well as feelings of social isolation. Participants rate each item as either O ("I often feel this way"), S ("I sometimes feel this way"), R ("I rarely feel this way"), N ("I never feel this way").

Appendix 7

Irrational Procrastination Scale

Procrastination Quotient

Note that questions 2, 5, and 8 are scored in the opposite direction from the other items.

Very Seldom or Not True of Me	*Seldom True of Me*	*Sometimes True of Me*	*Often True of Me*	*Very Often True, or True of Me*

Score

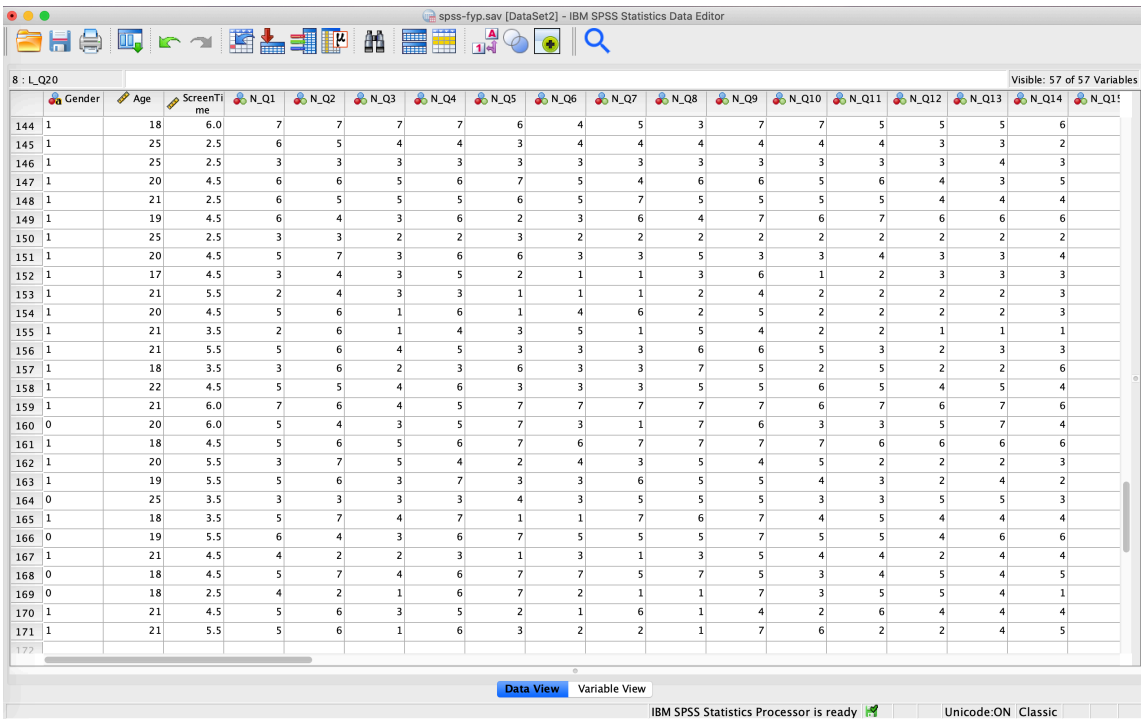
1. I delay tasks beyond what is reasonable.
   1 2 3 4 5 _____
2. I do everything when I believe it needs to be done.
   5 4 3 2 1 _____
3. I often regret not getting to tasks sooner.
   1 2 3 4 5 _____
4. There are aspects of my life that I put off, though I know I shouldn't.
   1 2 3 4 5 _____
5. If there is something I should do, I get to it before attending to lesser tasks.
   5 4 3 2 1 _____
6. I put things off so long that my well-being or efficiency unnecessarily suffers.
   1 2 3 4 5 _____
7. At the end of the day, I know I could have spent the time better.
   1 2 3 4 5 _____
8. I spend my time wisely.
   5 4 3 2 1 _____
9. When I should be doing one thing, I will do another.
   1 2 3 4 5 _____

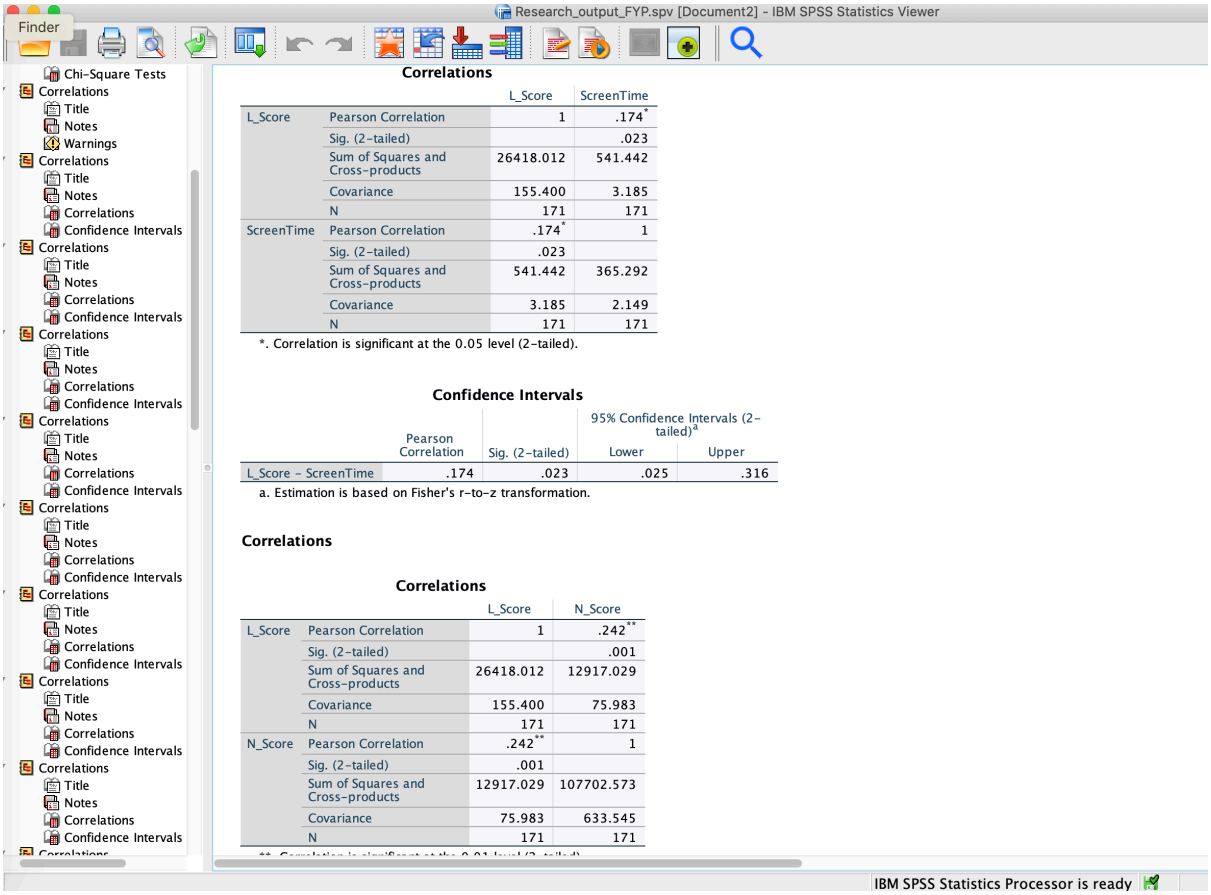
Total Score _____

Score	Compared to Everyone Else	
19 or less	You are in the bottom 10%	Your mantra is “first-things-first”
20–23	You are in the bottom 10–25%	
24–31	You are in the middle 50%	Average procrastinator
32–36	You are in the top 10–25%	
37 or more	You are in the top 10%	“Tomorrow” is your middle name

Appendix 8

SPSS Analysis & Output





Correlations

		L_Score	ScreenTime
L_Score	Pearson Correlation	1	.174*
	Sig. (2-tailed)		.023
	Sum of Squares and Cross-products	26418.012	541.442
	Covariance	155.400	3.185
	N	171	171
ScreenTime	Pearson Correlation	.174*	1
	Sig. (2-tailed)	.023	
	Sum of Squares and Cross-products	541.442	365.292
	Covariance	3.185	2.149
	N	171	171

*. Correlation is significant at the 0.05 level (2-tailed).

Confidence Intervals

			95% Confidence Intervals (2-tailed)[a]	
	Pearson Correlation	Sig. (2-tailed)	Lower	Upper
L_Score - ScreenTime	.174	.023	.025	.316

a. Estimation is based on Fisher's r-to-z transformation.

Correlations

Correlations

		L_Score	N_Score
L_Score	Pearson Correlation	1	.242**
	Sig. (2-tailed)		.001
	Sum of Squares and Cross-products	26418.012	12917.029
	Covariance	155.400	75.983
	N	171	171
N_Score	Pearson Correlation	.242**	1
	Sig. (2-tailed)	.001	
	Sum of Squares and Cross-products	12917.029	107702.573
	Covariance	75.983	633.545
	N	171	171