Facebook Addiction: 
An Exploratory Study Using Mixed Methods

A thesis submitted in fulfilment of the requirements for the degree of
Doctor of Philosophy

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Declaration of Authorship

I certify that, except where due acknowledgement has been made, the work is that of the author alone; the work has not been submitted previously, in whole or in part, to qualify for any other academic award; the content of the thesis is the result of work which has been carried out since the official commencement date of the approved research program; any editorial work, paid or unpaid, carried out by a third party is acknowledged; and ethics procedures and guidelines have been followed.

Tracii Ryan
Date: 29 August 2014
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Abstract

Having exceeded one billion active users, Facebook has become a global social networking phenomenon. While researchers have begun to examine many aspects of Facebook use, there is currently a lack of research focusing on the potential for Facebook use to become addictive. Despite this, anecdotal evidence of Facebook Addiction is abundant. To address this gap in the psychological literature, the present thesis provides an in depth examination of this potential construct.

Commonly, researchers measuring potential forms of addiction adapt symptoms from similar, more established, addictive disorders. In this thesis, Internet Addiction research was used as a basis for examining Facebook Addiction. However, it was acknowledged that this research should avoid a confirmatory approach, as Internet Addiction lacks construct validity. Furthermore, as Facebook has a strong social focus, it was argued that addiction to this site might involve symptoms that are different or unique from Internet Addiction. As such, an exploratory methodology was selected, incorporating three phases of research: a systematic review of existing Internet addiction symptoms, a small-scale qualitative study of self-identified problematic Facebook users, and a large-scale mixed methods study of self-identified excessive Facebook users.

In Phase 1, systematic literature searches were conducted in order to identify measures of Internet Addiction. While this process resulted an initial pool of 30 measures, only six met the inclusion criteria for thematic analysis. Within these six measures, 24 underlying factors were identified. Seven themes emerged from these factors: negative consequences, loss of control, online social enhancement, preoccupation, mood alteration, withdrawal, and excessive use. These themes were considered to be the core symptoms of Internet Addiction.

In Phase 2, participants were recruited using a paid Facebook Ad (N = 34, 53% women), and asked to complete a short online screening survey before registering for an online focus group. The seven core symptoms of Internet Addiction were used to influence the development of focus group questions. Four women and one man (N = 5) took part in the focus group. Although the sample size was small, evidence was present for each of the Internet Addiction symptoms. In addition, there was preliminary evidence for three potentially unique indicators: mood maintenance, social obligation, and disconnection. However, it was concluded that more research was necessary.
In Phase 3, participants were recruited using a combination of paid and free online advertising. The methods used in this phase included an online mixed methods survey and an online focus group. The seven core symptoms of Internet Addiction were again used to develop the survey and focus group questions. The sample comprised 417 (69% women) survey respondents and nine (78% women) focus group participants.

Examination of the descriptive statistics of survey participants indicated that women and young adults were more likely to use Facebook heavily. In addition, there was a significant positive correlation between heavy Facebook use and having higher levels of concern about Facebook use. As in Phase 2, thematic analysis of the qualitative responses supported all of the core symptoms of Internet Addiction. However, due to the larger dataset in Phase 3, the results provided more concrete evidence. In terms of additional potential indicators, it seems that boredom, disconnection, and fear of missing out may be relevant to Facebook Addiction.

In order to identify a subsample of potential Facebook addicts, qualitative data from Phase 3 were transformed into quantitative variables. These variables were then used to create a preliminary measure of Facebook Addiction. Applying a cut-off point of any four symptoms of addiction, a sample of 59 (85% women) potential Facebook addicts was identified. Further statistical analyses were conducted to determine whether Facebook Addiction takes different forms, and to identify predictors.

Cluster analysis resulted in the identification of three types of potential Facebook addicts: those heavily engaged in social activities and browsing, those who are shallowly engaged in social activities but heavily engaged in browsing, and those who are shallowly engaged both in social activities and browsing, but moderately engaged in gaming. In order to ascertain the predictors of Facebook Addiction, regression modelling was conducted. After several stages of analysis, a final parsimonious model was obtained. This included the following predictors: age, sex, level of Facebook use, and level of concern about Facebook use. This model successfully predicted 86% of potential Facebook addicts.

Through consideration of the results of this thesis, it was theorised that there may be four potential pathways to Facebook Addiction: online social enhancement, social monitoring, procrastination, and entertainment. The first is motivated by an insufficient offline social life, and supports previous theories of Internet Addiction. In contrast, the second may be specific to Facebook, and relates to the need to feel
socially included and engage in social monitoring. The third and fourth pathways may be relevant to various forms of media addiction, and involve task avoidance and the desire to escape from boredom. It was concluded that this thesis provides a first step towards understanding Facebook Addiction, but that more extensive exploratory and confirmatory research is needed to obtain construct validity.
Chapter 1  
General Introduction

For many of its 2.9 billion users (Internet Live Stats, 2014), the Internet has become an important part of daily life. Although it has various uses and applications, one of the most popular aspects of the Internet is the ease with which it facilitates social interaction (Kraut, Patterson, & Lundmark, 1998). Using applications such as email, instant messenger (IM), Voice over Internet protocol (VOIP), social networking sites, blogs, and discussion forums, people from around the world are able to connect with one another in ways that would have previously been difficult, costly, or impossible. This proliferation of Internet-mediated forms of communication has revolutionised social interaction, but what sort of impact will its long-term use have on personal relationships and psychological wellbeing? This question has engendered considerable research over the last two decades.

Kraut et al. (1998) were among the first researchers to investigate whether using the Internet for social purposes leads to positive or negative social and psychological outcomes. In order to do this, they conducted a longitudinal study based on data collected from 93 families in Pennsylvania. The results revealed that Internet use for communicative purposes decreased both social interaction and psychological wellbeing. However, when the same families were retested three years later (Kraut et al., 2002a), these negative effects were no longer apparent. In fact, some Internet users, such as extraverts and those with strong social support networks, actually increased their levels of social interaction and psychological wellbeing by using the Internet. This phenomenon, known as the “rich get richer” hypothesis, has since been widely verified (e.g., Desjarlais & Willoughby, 2010; Jin, 2013; Poley & Luo, 2012).

The follow-up study by Kraut et al. (2002a) demonstrates the role that personality can play in influencing outcomes associated with Internet use. This area has since been widely researched, and the results show that certain personality characteristics do influence the way people use the Internet. For instance, shy and introverted people have been found to feel more comfortable engaging in social interaction on the Internet in comparison with face-to-face interaction (Ebeling-Witte, Frank, & Lester, 2007). Such a result is easily explained: shy and introverted people often have difficulty expressing themselves in "real life" due to a perceived social
skills deficit and frequent monitoring of their self-presentation (Caplan, 2005). However, as communication on the Internet can often be asynchronous and anonymous, it allows individuals to control their self-presentation (Walther, 1996), and can induce an “online disinhibition effect” (Suler, 2005).

For shy people using the Internet, the level of control they have over their self-presentation, and the feelings of disinhibition they may experience, can lead to more frequent self-disclosure than in offline settings (Stritzke, Nguyen, & Durkin, 2004). This has been found to be associated with the formulation of stronger interpersonal relationships in shy people (Valkenburg & Peter, 2009). Taken at face value, it could be argued that Internet use is beneficial for shy and socially anxious individuals as it allows them to open up and connect to people in ways that have previously been difficult for them. This phenomenon is alternatively known as social compensation, or the “poor get richer” hypothesis (e.g., Desjarlais & Willoughby, 2010; Jin, 2013; Poley & Luo, 2012).

However, in some situations, this ability to more easily connect to others when communicating online can lead to detrimental outcomes. For instance, Caplan (2005) found that people with a deficit in social skills, who preferred Internet communication to face-to-face communication, were actually at risk of developing compulsive Internet use. Further findings indicate that compulsive Internet use, which involves an inability to control the urge to go online, also predicts the experience of negative outcomes. Based on these results, it seems that Internet use provides something of a paradox for individuals with social skills deficits (Allen, Ryan, Gray, McInerney, & Waters, 2014). On the one hand, these people may experience social compensation by communicating online. On the other hand, the enjoyment they gain from this communication may lead to negative personal outcomes.

The development of compulsive Internet use, and the negative outcomes associated with it, are generally considered to be indicative of Internet Addiction\(^1\) (Caplan, 2005; Greenfield, 1999; van den Eijnden, Meekerkerk, Vermulst, Spijkerman, & Engels, 2008). Griffiths (2000a) conceptualises Internet Addiction as a behavioural addiction, which is a term used to refer to cases of non-substance-based addictive symptomology (Griffiths, 1999). However, despite Internet Addiction being heavily researched since the mid 1990s, contention remains regarding its status as a legitimate form of mental disorder (Pies, 2009). Furthermore, Internet Addiction

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\(^1\) As will become apparent in Chapter 2, the use of this term is much debated. It has been used throughout this thesis as it aligns with the majority of the extant literature.
researchers fail to agree “on a universal theoretical framework, or on definitions, criteria, and core elements” (Meerkerk, van den Eijnden, Vermulst, & Garretsen, 2009, p. 1).

While the concept of Internet Addiction is much debated (Huisman, van den Eijnden, & Garretsen, 2001; Shaffer, Hall, & Vander Bilt, 2000), years of research confirm that negative outcomes can be associated with compulsive use of the Internet (Widyanto & Griffiths, 2006). Furthermore, a link has been established between the use of social applications of the Internet and the development of these negative outcomes (Caplan, 2010). Over the past decade, engaging in social behaviour using the Internet has become increasingly common. This trend can be attributed to the popularity of social networking sites (SNS) such as Facebook, MySpace, and Twitter. Facebook, in particular, has become so popular it is currently the second most frequently viewed website in the world (Alexa Internet Inc., 2014), boasting a membership of 1.32 billion monthly active users as of June 2014 (Facebook, 2014).

Due to the staggering statistics associated with Facebook use, researchers have begun exploring various factors underlying this social phenomenon. Research has occurred in several disciplines, such as sociology (Zhao, Grasmuck, & Martin, 2008), psychology (Gosling, Gaddis, & Vazire, 2007; Mehdizadeh, 2010), marketing (Moore & McElroy, 2012), management (Joinson, 2008; Moradabadi, Gharehshiran, & Amrai, 2012), media studies (Park, Kee, & Valenzuela, 2009), and communication (Walther, Van Der Heide, Kim, Westerman, & Tong, 2008). Overwhelmingly, the bulk of Facebook research has been associated with determining the personality types of users (i.e., Ross et al., 2009), identifying the motivations of Facebook use (i.e., Joinson, 2008), investigating issues associated with impression management (i.e., Gosling et al., 2007), and studying the effects on users’ social capital (i.e., Ellison, Steinfield, & Lampe, 2007).

In light of the popularity of Facebook, and the fact that there is a link between engaging in social interaction online and the development of addictive tendencies towards the Internet, it is not surprising that some researchers have begun to posit that Facebook use can become addictive (i.e., Koc & Gulyagci, 2013). While previous research has established that some people can develop addiction to social networking sites (for a detailed review of this topic see Griffiths, Kuss, and Demetrovics, 2014), it may be worth examining Facebook on its own (Andreassen & Pallesen, 2013; Ryan, Chester, Reece, & Xenos, 2014).
1.1. Statement of the Problem

At present, only limited research has investigated whether Facebook use can become problematic or addictive (e.g., Çam & Işbulan, 2012; Elphinston & Noller, 2011; Hong, Huang, Lin, & Chiu, 2014; Koc & Gulyagci, 2013; Lee, Cheung, & Thadani, 2012; Sofiah, Omar, Bolong, & Osman, 2011; Uysal, Satıcı, Akin, 2013; Zaremohzzabieh, Samah, Omar, Bolong, & Kamarudin, 2014). The lack of research in this area is surprising for two main reasons.

First, the link between social uses of the Internet and the development of Internet Addiction is well established. For instance, in 2000, Morahan-Martin and Schumacher reported that Internet Addiction was more prevalent among people who used the Internet for social purposes. Research by Caplan (2005) suggests that this association is even more pronounced for shy, introverted and socially anxious people. By studying the associations between personality and Facebook use, researchers have demonstrated that shy people do use Facebook (Orr et al., 2009; Ryan & Xenos, 2011). Based on this, the argument could be made that Facebook gratifies shy individuals’ need to communicate. If this were true, shy people could end up developing unhealthy patterns of Facebook use to compensate for the lack of an offline social life. Therefore, this may be one potential pathway to Facebook Addiction.

Second, there is a considerable amount of anecdotal evidence suggesting that Facebook use can become addictive. For instance, a recent article from India Today Online (2014) draws a link between Facebook Addiction and the suicide of two young women. In addition, the New Straits Times (Renganayar, 2010) quoted several students who made troubling remarks such as:

I sign into Facebook every day. There is no fixed time and I don’t keep track how long I’m on it. On certain days, the first thing I do when I wake up is log on to Facebook. Sometimes I get a sudden compulsion to be on it. (p. 12)

and:

I am on it at least two hours on weekdays but it will be significantly longer during weekends like six to seven hours. I find it addictive and want to be on it all the time. My family members and friends have told me that I spend too much time on it. (p. 12)

News articles have also quoted psychologists and counsellors who admit seeing an increasing number of patients experiencing Facebook Addiction. A psychologist is
quoted in an *Atlanta Journal Constitution* article (Valdes, 2009) as saying, “It has broken up marriages. I’ve had a number of people come to me with Facebook issues. Its everywhere.” Likewise, a more recent article from Australian newspaper *Daily Mercury* (Irving, 2013) quoted a relationship counsellor who said, "Social media can cause problems in some relationships. These problems began when Facebook started out and have been occurring ever since." On another note, *The Sydney Morning Herald* (Nunn, 2012) spoke to a psychologist who revealed that she had treated many patients who were experiencing anxiety as a result of Facebook Addiction.

Some people have set up blogs detailing their struggle to stop using Facebook. One blogger called Bobby L (2008) stated “[Facebook has] become so ingrained in my life, its going to be worse then (sic) when I managed to give up smoking, which I did COLD TURKEY after a 20 a day habit” (18 February, 2008. para. 19). After a week of trying to go without Facebook, Bobby L admitted being unable to stop returning, as “the drip, drip, drip of the mini-feed kept calling…the subtle call and lure of the digital slot machine” (28 February, 2008, para. 4). Another blogger, Saving Face (2010), writes of her addiction:

I have a problem. I am a Facebook addict. Facebook has become to me what meth is to a druggie. Just like them I have become isolated, lonely. Lost friends. Lost work. Just like them I have learned to escape by using a tool that is in fact destroying me. When I admit all that out loud I feel silly and foolish. How can the Internet be a drug? But it is. I've had so many goals for years that I've never seen through because I was too busy spending all my free time on Facebook. (1 January, 2010, para. 1)

While the above reports are anecdotal, they do reveal the negative impacts that seemingly addictive Facebook use can have for individuals. Based on this evidence, there is a strong argument that Facebook Addiction deserves the attention of psychologists. In particular, it is necessary for researchers to establish whether this potential disorder exists. Of the few studies that have attempted such research, most have been confirmatory, and in each case Facebook Addiction was assessed using different measures. In several cases, these measures were simply reworded and adapted measures of Internet Addiction (Çam and Işbulan, 2012; Hong et al., 2014; Koc & Gulyagci, 2013; Lee et al., 2012). As Facebook is an application of the Internet, it is unsurprising that researchers have chosen to modify Internet Addiction measures when measuring this phenomenon. However, while there is no doubt that
some Internet Addiction research bears relevance to Facebook Addiction, the conceptual chaos underlying Internet Addiction lessens the impact of such research.

Some scholars have avoided this challenge by borrowing criteria or items from more widely accepted forms of addiction, such as *Pathological Gambling*, when measuring Facebook Addiction (e.g., Andreassen, Torsheim, Brunborg, & Pallesen, 2012). However, borrowing criteria or measures from conceptually different forms of addiction can be problematic as well. For instance, in the third edition of the *American Psychiatric Association* (APA; 1980) *Diagnostic and Statistical Manual of Mental Disorders (DSM-III)*, Pathological Gambling was diagnosed using a reworded set of *Substance Dependence* criteria (Committee on the Social and Economic Impact of Pathological Gambling, Committee on Law and Justice, Commission on Behavioral and Social Sciences and Education, National Research Council, 1999). However, after complaints from clinicians regarding the relevance of these criteria, they were altered to include items that were more specific to Pathological Gambling, such as chasing losses. Based on examples such as this, there is a strong need for exploratory research into emerging forms of behavioural addiction, rather than just borrowing established criteria from other disorders. Further, it is important that this kind of research occurs from the outset of investigation into these areas, and is used to inform the creation of a targeted measure or set of criteria. Without such research, a measure of Facebook Addiction may fail to achieve content validity.

Previous research has indicated that Internet Addiction can take several different forms, such as gaming addiction, online gambling addiction, and addiction to computer mediated communication. Similar findings may also hold true for Facebook Addiction. The fact that the current body of research has not taken this into account is another serious limitation. Although it was initially created as a social networking site, Facebook now provides its users many kinds of activities with which to engage. Research also suggests that Facebook users are motivated by several different gratifications, including relationship maintenance, passing time, and entertainment seeking (Ryan et al., 2014).

Another issue relating to the current body of Facebook Addiction literature is that it has generally been based on results derived from samples of university students. Although Facebook did begin its existence as a social networking tool for college students, it has since expanded to become the most popular social networking site in the world (Ballve, 2013). This fact suggests that student-based research is not representative of the majority of Facebook users. Supporting this
notion, a recent survey of Internet users in America (Duggan & Smith, 2013) found that 78% of respondents aged between 30 and 49 years were Facebook users, as were 65% of people aged between 50 and 64 years, and 46% of people over 65 years. It is therefore time that researchers move beyond student samples to look at more representative populations. This point is especially germane for scholars interested in Facebook Addiction, as generalizable results are imperative for the development of a valid construct.

Given the high penetration of Facebook use worldwide, and the knowledge that social uses of the Internet can become addictive for some people, researchers should begin to explore whether Facebook Addiction is a legitimate form of psychopathology and, if so, how it can best be diagnosed and treated. By doing so, they can better understand whether Facebook Addiction fits within the construct of Internet Addiction, or whether it should be conceptualised as a separate and unique condition.

1.2. Aim and Scope

The aim of this thesis was to perform an in-depth exploratory investigation of Facebook Addiction among adult users. This investigation centred around five core research questions:

Research Question 1. What are the common symptoms underlying measures of Internet Addiction?
Research Question 2. Can a common set of Internet Addiction symptoms be used to identify Facebook addicts?
Research Question 3. Is there any indication that there are symptoms or indicators of Facebook Addiction that are unique from the common set of Internet Addiction symptoms?
Research Question 4. Does Facebook Addiction take different forms?
Research Question 5. Do certain demographic, behavioural, or attitudinal variables predict Facebook Addiction?

In order to answer these five research questions effectively, a mixed methods approach was used with and a combination of exploratory (inductive logic) and confirmatory (deductive logic) research methodologies. This represents an important step forward for scholarship in this area, as the reliance on deductive reasoning and
confirmatory techniques shown by other researchers fails to discover novel observations (Stebbins, 2001). Unless efforts are made to obtain a solid understanding of the unique aspects involved with Facebook Addiction, it will be impossible to create a measure or set of diagnostic criteria that attains an acceptable level of content validity. For this reason, exploratory research is imperative.

According to Stebbins (2001), the purpose of exploratory research is the development of theory that has been informed by data. Proceeding in this way, exploratory research does not usually need to take influence from existing theory. However, for the purposes of this study, scholarship from the field of Internet Addiction research was drawn upon to inform the development of questionnaires. The reason for this is simple; Facebook is an application of the Internet, and it is therefore plausible that much of the research relating to Internet Addiction will bear some relevance to Facebook use. As Ali and Birley (1999) point out, the integration of inductive and deductive research methods appears to present a dichotomy, however, they argue that this approach can be managed in an epistemologically sound way.

By performing a mix of inductive and deductive research, the construct validity of Facebook Addiction should be improved. It will then be possible to obtain a clearer picture about the condition as a whole. This will be advantageous to Facebook addicts, as it will enable more accurate diagnosis. Furthermore, mental health professionals will be able to formulate more useful clinical interventions if they understand the unique elements of the condition in question, rather than extrapolating information from conceptually similar disorders. Finally, the findings of a mixed methods study should also benefit researchers, providing a first step towards the generation of theory relating to Facebook Addiction.

1.3. Significance of the Thesis

The outcomes of this thesis should lead to a deeper understanding of whether Facebook Addiction does actually exist, and if so, whether it is a specific form of Internet Addiction or whether it is a standalone disorder. As this study is predominantly exploratory, it is expected that further exploratory and confirmatory research in this area will ensue. Once the aspects associated with Facebook Addiction have been identified, it would then be appropriate to develop targeted measures and diagnostic criteria. Only then can psychologists really begin to learn the prevalence, predictors, and comorbidities of this prospective disorder. Following
1.4. Overview of the Thesis

As discussed above, this thesis was influenced by scholarship from the domain of Internet Addiction. However, as a construct, Internet Addiction is not entirely clear. In light of this, Chapter 2 presents a review of the main conceptual issues underlying Internet Addiction. This provides context for Chapter 3, which presents a review of Internet Addiction research. As will become evident in Chapter 4, the depth of research associated with Facebook Addiction is limited. As such, the methodology used within this thesis was based on an exploratory approach. This methodology will be discussed in detail in Chapter 5. Due to the conceptual chaos surrounding Internet Addiction, there is no obvious set of criteria or existing measurement instrument that can be selected and adapted to measure Facebook Addiction. For this reason, it was necessary to conduct a systematic review of Internet Addiction measures to identify common symptoms. The processes and results of the systematic review are discussed in Chapter 6.

Chapter 7 describes and presents a small-scale mixed methods study of Facebook Addiction, designed to determine whether Facebook Addiction can be measured using common symptoms of Internet Addiction, whether there are any unique symptoms or identifiers of Facebook Addiction, and whether Facebook Addiction takes different forms. This limited data set was complemented by a larger mixed methods study of Facebook Addiction (Chapter 8). The results of this study are presented in Chapters 8 through 10. Finally, Chapter 11 focuses on the theoretical implications of the findings, and suggests areas for future research.
Chapter 2
The Conceptual Chaos of Internet Addiction

As stated in the previous chapter, one of the aims of this thesis was to establish whether Facebook Addiction is similar to Internet Addiction, or whether it involves unique components. In order to attend to this aim, it was important to first understand what Internet Addiction is. In general, if a researcher wishes to understand a particular disorder, they could read the most eminent research papers in the field, identify the defining theories, and examine the relevant diagnostic criteria. However, in the case of Internet Addiction, matters are not so straightforward. In fact, there is a large degree of inconsistency and complexity underlying the concept of Internet Addiction. As a precursor to a traditional literature review, this chapter is designed to explore the issues inherent in Internet Addiction research.

The first serious discussions and analyses of Internet Addiction emerged during the second half of the 1990s (Brenner, 1997; Greenfield, 1999; Young, 1996). However, despite much advancement in the area since then, the editors of the latest version of the DSM (DSM-5; APA, 2013) fail to acknowledge that Internet Addiction is a legitimate form of psychopathology. A commentary published by one of the members of the DSM-5 working group (O'Brien, 2010) suggests that this omission is due to a lack of evidence from longitudinal studies regarding treatment, relapse rates, predisposing factors, and co-morbidity. In order for this type of research to occur, there needs to be a strong sense of construct validity associated with Internet Addiction research. Unfortunately, as this chapter will reveal, this is not currently the case.

In a 2009 paper, Meerkerk et al. write of the persistent sense of "conceptual chaos" associated with Internet Addiction. This can be attributed to the fact that, since research in this area began, there has been a lack of unification surrounding many of the basic concepts of the psychological construct. For example, there are many contrasting opinions about appropriate terminologies and definitions, and there are no universally accepted diagnostic criteria or gold standard measures. A further issue stems from the fact that a significant proportion of the criteria and measures that have been proposed have influenced by other established disorders, such as Substance Dependence and Pathological Gambling. However, the relevance of borrowing criteria for this purpose has been called into question by some writers
In order to gain a sense of what Internet Addiction is, it is important that inconsistencies associated with describing and assessing Internet Addiction are addressed. To begin, this chapter will present several of the most common reasons why certain researchers have avoided using the term *addiction* to refer to this construct. In doing so, it will focus predominantly on two main issues: the absence of the term in the *DSM* (APA, 1987; 1994; 2000), and the belief that addiction must involve the ingestion of a substance. It will then argue that recent changes to the *DSM-5* (APA, 2013) should negate the impact of these two issues.

Moving on to the issue of defining Internet Addiction, it will be argued that addiction in general is a notoriously difficult concept to explain. This is, perhaps in part, due to the fact that the term has not been endorsed in the *DSM* (APA, 1987; 1994; 2000) for many years. Also included within this chapter is a discussion of the various diagnostic criteria and measures that have been proposed. Two methods of assessment will be highlighted in particular, as they are the most well accepted measures in use today. The first is *Young’s Diagnostic Questionnaire* (YDQ; Young, 1996), and the second is the *Internet Addiction Test* (IAT; Young, 1998).

### 2.1. Terminology

Since the advent of research in the area, scholars have disagreed regarding the appropriate nomenclature when referring to Internet Addiction. While it is true that many renowned writers on the subject use the term addiction (i.e., Griffiths, 1999; Young, 1996), this trend is by no means universal. Some authors have avoided referring to addiction at all, devising terms such as *Compulsive Internet Use* (Greenfield, 1999; Meerkerk et al., 2009), *Pathological Internet Use* (Davis, 2001; Morahan-Martin & Schumacher, 2000), *Problematic Internet Use* (Aboujaoude, Koran, Gamel, Large, & Serpe, 2006; Caplan, 2003; Shapira et al., 2003), *Internet Behaviour Dependence* (Hall & Parsons, 2001), and *Excessive Internet Use* (Allam, 2010; Beard & Wolf, 2001), to name just a few.

There are several reasons that scholars are reluctant to use the term addiction to describe pathological use of the Internet. Interestingly, the rationale for this omission appears to have changed as research in this area has progressed. Some early researchers avoided using the term due to the fact that there had simply not been enough research to justify its use (i.e., Brenner, 1997). A few years later, critics such as Huisman et al. (2001) and Shaffer et al. (2000) suggested that Internet
Addiction may not be a distinct disorder, but instead may exist as a symptom of another (or several other) forms of psychopathology. Following more research in the area, authors began to point to the stigma associated with the term (Morahan-Martin, 2005; Rotunda, Kass, Sutton, & Leon, 2003), and to posit that addiction is best replaced with a word that has fewer negative connotations, such as ‘pathological’ or ‘problematic’. More recently, the trend has been to argue that Internet use per se is not addictive, but rather it provides the means with which to engage in other real world addictive behaviours, such as gambling and shopping (Meerkerk et al., 2009; Yellowlees & Marks, 2007).

In addition to the aforementioned reasons, two other important issues have been brought to the fore. Both of these issues relate to definition and classification conventions that have perpetuated since the DSM-III-R was published (APA, 1987). The first issue is that the DSM-III-R failed to include the term addiction at all (Davis, 2001; Young, 1996), replacing that term with the word dependence. The second issue relates to the fact that there was no endorsement of behavioural addictions (or dependencies) (Davis, 2001; Griffiths, 1996). The following section will expand on both of these issues. Although changes to the DSM-5 (APA, 2013) have addressed both of these concerns, they nevertheless had a significant effect on the majority of Internet Addiction studies up to this point.

2.1.1. Absence of addiction in the DSM. According to O’Brien, Volkow, and Li (2006), the reason for the omission of the term addiction from the DSM-III-R (APA, 1987) was not due to denial of the legitimacy of the condition, but rather, because of issues associated with the semantics of the term. O’Brien, who served on the revisions committee for the DSM-III-R notes that some committee members felt that the term addiction was derogatory, and “would add to the stigmatisation of people with substance use disorders” (O’Brien et al., 2006, p. 764). The DSM committee held a vote to resolve the matter, and the term dependence won out over addiction by a single vote.

However, as O’Brien et al. (2006) explain, the decision to use the term dependence to connote pathological addiction has led to confusion among some clinicians. This is because the word had previously been used to refer specifically to the responses of tolerance and withdrawal that occur following exposure to substances that cause adaptation effects in the central nervous system. As these responses are naturally occurring, when they appear in isolation of compulsive drug-seeking behaviour, they are not considered to be pathological. Therefore, prior to the
shift in terminology, the experience of tolerance and withdrawal alone were not enough to warrant a diagnosis of psychopathology.

While this remained the case after the updates to the *DSM-III-R* (APA, 1987) were published, some clinicians became confused by the inconsistent definitions and refused to give pain medication to non-addicted patients who showed symptoms of tolerance and withdrawal. In their paper, O'Brien et al. (2006) argue that the unnecessary suffering of individuals in chronic pain due to physicians' misunderstanding of confusing terminology outweighs any potential negative connotations of the term addiction. They therefore suggested that the term dependence should be replaced with addiction in the *DSM-5* (APA, 2013). It appears as if the *DSM* revisions committee has given weight to the concerns of the argument from O'Brien et al., as the term dependence has been entirely removed from *DSM-5*. The naming convention of addictive disorders now takes the following format: name of the addictive substance, followed by *disorder*. In this way, Substance Dependence has become *Substance Use Disorder*.

### 2.1.2. Use of substance

Historically, the decisions of the *DSM* committee have perpetuated the argument that addictions cannot occur in the absence of substance use. Although the criteria used to diagnose Pathological Gambling were influenced by the criteria for Substance Dependence (Committee on the Social and Economic Impact of Pathological Gambling et al., 1999), the fact that this disorder did not involve the use of a substance meant that it was classified as an *Impulse-Control Disorder (Not Elsewhere Specified)*. Due to this, Pathological Gambling was grouped with disorders such as *Kleptomania* and *Intermittent Explosive Disorder*, rather than Substance Dependence. This decision has no doubt contributed to the fact that Pathological Gambling has not been universally accepted as a legitimate form of addiction.

A well-known opponent of this line of thinking is Mark Griffiths, who has spent much of his career writing on the subject of *behavioural addictions*. A behavioural addiction, by definition, is an addictive pattern of behaviour that occurs in the absence of an addictive substance (Albrecht, Kirschner, & Grüsser, 2007). Griffiths has authored or co-authored numerous articles supporting the notion that behaviours such as gambling (Griffiths, 1990; Griffiths, 1996), exercise (Berczik et al., 2012; Warner & Griffiths, 2006), video game playing (Chappell, Eatough, Davies, Griffiths, 2006; Hussain, Griffiths, & Baguley, 2012) and Internet use (Griffiths, 1999; 2000a) can become addictive. To support his work, Griffiths (1996) argues that these
maladaptive behavioural patterns should be considered addictions as they involve the same symptoms as substance-related addictions, such as Substance Dependence and Substance Abuse.

Recent changes to disorder classifications in the *DSM-5* (APA, 2013) provide support for Griffiths’ views. What were once known as Substance-Related Disorders have been updated to the classification of *Substance-Related and Addictive Disorders*. This classification now incorporates both substance and non-substance related addictions, which means that the condition formerly known as Pathological Gambling is now viewed as an addictive disorder. This is a rather large step forward for behavioural addictions researchers, as it endorses the idea that addictions to behaviours can occur.

Currently, *Gambling Disorder* is the only non-substance related addictive disorder to be included in the *DSM-5* (APA, 2013), but this may change in future editions. *Internet Gaming Disorder* has been included in an appendix to the manual; the editorial committee recommended that more clinical research is necessary before it is included in the manual proper. While this falls short of the inclusion of Internet Addiction itself, it is a step closer to legitimising Internet-related behavioural addictions. However, by including only Internet Gaming Disorder, the *DSM-5* editorial committee appears to be still in doubt about the legitimacy of addiction to general use of the Internet. It is clear that more convincing and consistent research is required to support its future inclusion.

### 2.2. Defining Internet Addiction

In order to argue that the term *addiction* is appropriate when describing pathological use of the Internet, researchers first need to be able to provide a clear and precise definition of what addiction is. However, somewhat surprisingly, this has been difficult to achieve (Griffiths, 1999). As with the issues discussed in Section 2.1, it is plausible that this difficulty can be partially accredited to the fact that the term was banished from the *DSM-III-R* (1987). Since that time, many authors have proposed definitions for addiction (i.e., Marks, 1990; Marlatt, Baer, Donovan, & Kivlahan, 1988), however none have been universally accepted.

Shaffer et al. (2000) present a lucid discourse on this topic in their critical evaluation of Internet Addiction research. Despite the fact that there are no clear

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2 Due to the change in naming conventions in *DSM-5*, Pathological Gambling is now known as Gambling Disorder.
operational definitions of addiction, they point out that the term has been used to describe all manner of behaviour, such as dependence towards food (i.e., Parylak, Koob, & Zorrilla, 2011) and sex (i.e., Briken, Habermann, & Berner, 2007). Having argued that the term has been used frequently by scientists, and appropriated by the general public, Shaffer et al. suggest that it should be considered as little more than a lay term. They also explain that, despite these issues, modern thinkers in the field tend to recognise three main symptoms of addiction: "craving or compulsion, loss of control, and persistence in the behaviour despite accruing adverse consequences" (p. 162). However, as these symptoms are not widely agreed upon, they assert that they should be considered only as a guide.

As the overall concept of addiction is subject to various interpretations, it is unsurprising that Internet Addiction has also been repeatedly criticised for lacking a clear and consistent definition (Beard & Wolf, 2001; Caplan, 2005; Davis, 2001; Huisman et al., 2001; Shaffer et al., 2000). To get around this problem, Internet Addiction scholars tend to take one of three approaches. First, some fail to provide a definition of Internet Addiction at all (e.g., King, Delfabbro, Griffiths, & Gradisar, 2011; Young, 2011; Yuan et al., 2011). Second, some researchers do provide a definition, but it lacks specificity. For example, Cheung and Wong (2011) suggest that Internet Addiction is marked by dependence on any sort of online activity, while Fisoun et al. (2011) refer to negative impacts in social or professional life as a direct or indirect result of excessive Internet use. The third, and most common, approach is to list a number of symptoms by which one can recognise Internet Addiction. While this approach is an acceptable means of defining a construct, there tends to be a high degree of variation between the symptoms included by authors. To illustrate this idea, definitions from several early papers relating to Internet Addiction are provided in Table 2.1. To ensure that all authors of the included papers would have had access to similar extant literature, only literature published between 1997 and 2000 are included.

Comparison of these definitions highlights similarities and differences. In terms of similarities, most of the definitions include symptoms relating to withdrawal and tolerance. Interestingly, these researchers have conceptualised withdrawal in various ways, such as unpleasant feelings (Cooper, Scherer, Boies, & Gordon, 1999), increased anxiety (Young, Pistner, O'Mara, & Buchanan, 2000), and feeling irritable or moody when offline (Chou & Hsiao, 2000; Mitchell, 2000). Most studies also refer to Internet use that causes conflict and impairment in important areas, such as
### Table 2.1

**Contrasting Definitions of Internet Addiction Published between 1997 and 2000**

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Year</th>
<th>Definition of Internet Addiction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brenner</td>
<td>1997</td>
<td>Withdrawal, tolerance and craving                                                                _operationally, these symptoms can be characterized by a sense of discomfort when the Internet is unavailable, a desire to continue using it, and a sense of gratification when using it.</td>
</tr>
<tr>
<td>Cooper et al.</td>
<td>1999</td>
<td>Implies a psychological dependence on the Internet that is characterised by an increasing investment of resources in related activities, unpleasant feelings when offline, increasing tolerance to the effect of being online, and denial of the problematic behaviour</td>
</tr>
<tr>
<td>Lin &amp; Tsai</td>
<td>1999</td>
<td>Compulsive behaviours, withdrawal, tolerance, impaired social or personal functions</td>
</tr>
<tr>
<td>Young et al.</td>
<td>2000</td>
<td>Preoccupation with the Internet, increased anxiety when offline, hiding or lying about extent of use, impairment to real life functioning (in particular, social isolation, increased depression, familial discord, divorce, academic failure, financial debt, and job loss)</td>
</tr>
<tr>
<td>Chou &amp; Hsiao</td>
<td>2000</td>
<td>Use of Internet becomes most important activity in daily life and dominates thinking, arouses a “high” and “escape from the real world”, spend increasing amounts of time online to achieve desired effect, feel irritable or moody when offline, Internet use causes conflicts with significant others or important activities, experiences relapse</td>
</tr>
<tr>
<td>Mitchell</td>
<td>2000</td>
<td>Compulsive overuse of the Internet and irritable or moody behaviour when deprived of it</td>
</tr>
<tr>
<td>Morahan-Martin &amp; Schumacher</td>
<td>2000</td>
<td>Internet use that causes academic, work or interpersonal problems, personal distress, withdrawal symptoms, mood altering use, guilt, excessive time spent online</td>
</tr>
<tr>
<td>Shapira, Goldsmith, Keck, Khosla, &amp; McElroy</td>
<td>2000</td>
<td>Inability to control use of the Internet which causes marked distress and/or functional impairment</td>
</tr>
</tbody>
</table>

interpersonal relationships, academic or professional functioning, and/or daily activities. Other symptoms repeatedly mentioned are preoccupation with the Internet, lying about use, and excessive or compulsive use.

In terms of differences among symptoms, several papers identify unique items. For instance, Chou and Hsiao (2000) list the experience of a “high” and an “escape from reality” when using the Internet. In a similar vein, Morahan-Martin and Schumacher (2000) refer to mood-altering use. The latter authors also mention guilt, which is not referred to in any of the other studies. Finally, Brenner (1997) writes that craving is an important component of addiction, and if pathological use of the Internet
is a legitimate disorder, evidence for this symptom must be demonstrated.

As this discussion shows, there has been heterogeneity associated with Internet Addiction definitions ever since research began. An analysis of more current literature reveals that the same issues still apply. While similar symptoms are still being endorsed, such as withdrawal (Kittinger, Correia, & Irons, 2012), tolerance (Kittinger et al., 2012), preoccupation (Cheung & Wong, 2011; Kittinger et al., 2012; Villella et al., 2011), excessive use (Fisoun et al., 2011; Hawi, 2012), and loss of control (Bozoglan, Demirer, & Sahin, 2013; Lopez-Fernandez, Honrubia-Serrano, Gibson, & Griffiths, 2014), there is still little consistency. This effect can be predominantly attributed to the fact that there are various methods for diagnosing Internet Addiction, and these have historically been based on borrowed criteria from conceptually related disorders. This issue is examined in detail in Section 2.3, as it is likely to be a large contributor to much of the confusion surrounding Internet Addiction.

Despite the variation that still occurs, there appears to be a strong trend in recent Internet Addiction research to refer to the experience of some sort of negative life consequences as a result of Internet use. While these consequences vary among scholars, there are common themes, such as decreased academic or occupational functioning (Fisoun et al., 2011; Kittinger et al., 2012; Liberatore, Rosario, Colon-De Marti, & Martinez, 2011), problems with interpersonal/social relationships (Fisoun et al., 2011; Hawi, 2012; Kittinger et al., 2012; Liberatore et al., 2011), and declines in both physical (Hawi, 2012) and psychological (Hawi, 2012; Kittinger et al., 2012) wellbeing. It appears then that the experience of these sorts of negative consequences is almost universally recognised as being an important factor underpinning Internet Addiction (Fisoun et al., 2011).

### 2.3. Diagnosing Internet Addiction

While there have been at least nine legitimate attempts to provide diagnostic criteria for Internet Addiction (Young, 1996; Scherer, 1997; Greenfield, 1999, Griffiths, 1999; Shapira et al., 2000; Shapira et al., 2003; Aboujaode, Koran, Gamel, Large, & Serpe, 2006; Ko et al., 2009; Tao et al., 2010), most of these have been based on criteria from existing conditions that are considered to be conceptually related. These conditions can all be found within the DSM-IV-TR$^3$ (APA, 2000) under

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$^3$ Although the DSM-5 has been recently released, the DSM-IV-TR was the most current version available when the cited authors were devising their diagnostic criteria.
one of three classifications: *Substance-Related Disorders, Impulse-Control Disorders*, and *Obsessive-Compulsive Disorder*. This demonstrates a lack of clarity regarding which kind of disorder is most conceptually similar to Internet Addiction. Furthermore, while these disorders are perceived by the respective authors to be conceptually similar to Internet Addiction, there is generally minimal justification provided to support this perception.

The next section provides an overview of the diagnostic criteria for Internet Addiction. As a detailed discussion of all of the proposed diagnostic criteria is outside the scope of this thesis, only those that have made an impact in the field have been included. This discussion will be structured thematically, according to the *DSM-IV-TR* (APA, 2000) classification of the three influencing classifications introduced above. An additional sub-section will also be incorporated, in order to discuss diagnostic criteria that were based on a combination of *DSM-IV-TR* disorders.

### 2.3.1. Substance-Related Disorders.

In 1995, American psychiatrist Ivan Goldberg posted a message to the *PsyCom.Net* listserv, an online mailing list for mental health clinicians founded by Goldberg himself (New Yorker, 1997, cited at psycom.net). In the message, he introduced a new online group called *The Internet Addiction Support Group* (IASG), which had been established due to what he referred to as the increasing prevalence of *Internet Addiction Disorder* (IAD). He also introduced a set of diagnostic criteria for IAD, which he created by combining the *DSM-IV* (APA, 1994) criteria for Substance Dependence (Appendix A) and *Substance Withdrawal* (Appendix B). These criteria were then reworded so they related to Internet misuse. The criteria proposed by Goldberg were:

*Internet Addiction Disorder (IAD) - Diagnostic Criteria*

A maladaptive pattern of Internet use, leading to clinically significant impairment or distress as manifested by three (or more) of the following, occurring at any time in the same 12-month period:

(I) Tolerance, as defined by either of the following:

(A) A need for markedly increased amounts of time on Internet to achieve satisfaction

(B) Markedly diminished effect with continued use of the same amount of time on Internet

(II) Withdrawal, as manifested by either of the following:
(A) The characteristic withdrawal syndrome

(1) Cessation of (or reduction) in Internet use that has been heavy and prolonged

(2) Two (or more) of the following, developing within several days to a month after Criterion 1:

   (a) psychomotor agitation
   (b) anxiety
   (c) obsessive thinking about what is happening on Internet
   (b) fantasies or dreams about Internet
   (e) voluntary or involuntary typing movements of the fingers

(3) The symptoms in Criterion B cause distress or impairment in social, occupational or other important area of functioning

(B) Use of Internet or a similar online service is engaged to relieve or avoid withdrawal symptoms

(III) Internet is often accessed more often or for longer periods of time than was intended

(IV) There is a persistent desire or unsuccessful efforts to cut down or control Internet use

(V) A great deal of time is spent in activities related to Internet use (e.g., buying Internet books, trying out new WWW browsers, researching Internet vendors, organising files of downloaded materials)

(VI) Important social, occupational, or recreational activities are given up or reduced because of Internet use

(VII) Internet use is continued despite knowledge of having a persistent or recurrent physical, social, occupational, or psychological problem that is likely to have been caused or exacerbated by Internet use (sleep deprivation, marital difficulties, lateness for early morning appointments, neglect of occupational duties, or feelings of abandonment in significant others)

Although he was not a researcher, Goldberg is often cited as being the first person to provide a diagnostic criteria for Internet Addiction (DiNicola, 2003; Meerkerk, van den Eijnden, & Garretsen, 2006; Odaci, 2011). However, what some authors (e.g., Park, Kim, & Cho, 2008; Tonioni et al., 2012; Yang & Tung, 2007) do
not reveal is that this discovery was made purely by accident. It was Goldberg’s intention that the members of the listserv would recognise his “official criteria” as a satirical swipe at the increasing complexity and inflexibility of the latest version of the *DSM* (New Yorker, 1997, cited at psycom.net). However, rather than accepting the criteria as a parody, members of the listserv wrote to Goldberg admitting that many of the items applied to their own Internet-related behaviour. After receiving several such emails, Goldberg felt it was necessary to formally set up the IASG to provide a source of support for those individuals.

**2.3.2. Pathological Gambling.** While Goldberg was the first mental health professional to propose (albeit jokingly) a set of diagnostic criteria for Internet Addiction, Kimberley Young (1996) was the first researcher to publish Internet Addiction criteria supported by empirical research. Rather than borrowing from substance related disorders as Goldberg had, Young created the *Diagnostic Criteria for Internet Addiction* (also known as *Young’s Diagnostic Questionnaire*, or *YDQ*) based on the *DSM-IV* (APA, 1994) entry for Pathological Gambling (Appendix C). The items in the YDQ are:

1. Do you feel preoccupied with the Internet (think about previous online activity or anticipate next online session)?
2. Do you feel the need to use the Internet with increasing amounts of time in order to achieve satisfaction?
3. Have you repeatedly made unsuccessful efforts to control, cut back, or stop Internet use?
4. Do you feel restless, moody, depressed, or irritable when attempting to cut down or stop Internet use?
5. Do you stay online longer than originally intended?
6. Have you jeopardised or risked the loss of significant relationship, job, educational or career opportunity because of the Internet?
7. Have you lied to family members, therapist, or others to conceal the extent of involvement with the Internet?
8. Do you use the Internet as a way of escaping from problems or of relieving a dysphoric mood (e.g., feelings of helplessness, guilt, anxiety, depression)?

This diagnostic tool contains reworded versions of eight of the ten Pathological Gambling criteria. Young (1996) explains that she chose to exclude two criteria related to borrowing money and committing legal acts as she considered them to have little relevance to Internet usage. However, even though the YDQ contained fewer items, she maintained that a cut-off of any five items should be required in
order for an individual to receive a diagnosis of Internet Addiction. As this is the same number of items needed to diagnose Pathological Gambling, Young suggested that the YDQ was “more rigorous” (p. 239) than the diagnostic criteria on which it was based.

Young (1996) justified her decision to diagnose Internet Addiction using modified Pathological Gambling criteria by arguing that this was the only non-substance based form of pathology included in the *DSM-IV* (APA, 1994) that showed resemblances to addiction. It appears as if Young chose not to use substance-related criteria to avoid criticism from those who believed that addiction must include a substance. As already discussed, the *DSM-IV* did not classify Pathological Gambling as an addiction, but instead marked it as a form of Impulse-Control Disorder. Due to this, Young was forced to conceptualise Internet Addiction as an Impulse-Control Disorder as well. However, despite this, Young continued to refer to the condition as Internet Addiction. Unfortunately, this choice of nomenclature has added to the confusion over the correct terminology for this disorder (Brenner, 1997; Davis, Flett, & Besser, 2002; Morahan-Martin & Schumacher, 2000).

To assess the usefulness of the YDQ, Young obtained a sample of 496 participants (221 male, 282 female). After scoring the YDQ, 396 (80%) of the respondents met the cut-off for Internet Addiction and were classified as dependent Internet users. Only 100 (20%) respondents were classified as non-dependent Internet users. It has been argued that these results indicate bias towards individuals with problematic Internet use (Morahan-Martin & Schumacher, 2000). This bias is likely due to Young’s choice of sampling techniques, which involved posting on online support groups for people who had self-identified as Internet addicted, and providing recruitment information via search engines to people who searched for “Internet Addiction”.

Rather than providing a breakdown of frequency of endorsement of each item, Young (1996) performed comparative analyses of the dependent and non-dependent groups on several descriptive variables. For instance, she reported that dependents spent a great deal more time online per week for non-work related purposes (38.5 hours) than non-dependents (4.70 hours). Young interpreted this result as demonstrating evidence of tolerance in Internet dependents.

Young (1996) also asked participants whether their Internet use had caused any problems in their lives. Non-dependent respondents did not report any serious problems with their Internet use, other than losing track of time occasionally whilst
logged on. On the other hand, dependent respondents reported experiencing numerous problems associated with their online activities. Young classified these problems into five themes: academic, relationship, financial, occupational, and physical. With the exception of physical problems, over 50% of dependents rated themselves as having experienced severe problems in each of these four areas. Additionally, between 34-45% of dependents rated themselves as having moderate problems in each of those areas. For instance, students reported losing control over their Internet use to the extent that they received poor grades, were put on academic probation, or even expelled from university. Likewise, employees admitted losing their jobs after spending large amounts of time using the Internet at work.

Young (1996) made two main conclusions based on her results. First, she argued that individuals can develop disordered Internet use in ways that show similarities with Pathological Gambling. She also made links with substance-based addictions, stating that some of the behaviour shown by Internet dependents, for instance their inability to stop using the Internet in the face of serious negative consequences, is akin to behaviour demonstrated by alcoholics. While accepting that more detailed research was necessary, Young proposed that the YDQ "provides a workable framework for further exploration of addictive Internet use" (p. 10).

Since it was published, the YDQ has become the most frequently used set of diagnostic criteria for Internet Addiction (Dowling & Quirk, 2009). An analysis of the extant literature reveals that the YDQ is most commonly utilised as a self-report scale (Bakken, Wenzel, Götestam, Johansson, & Oren, 2009; Fisoun et al., 2011; Huang et al., 2009), but it has also been used in clinical interview settings (e.g., Yao, Han, Zeng, & Guo, 2013). The most common reason that the YDQ has been selected over other diagnostic criteria appears to be academic presence; researchers choose to use it because other researchers have used it in previous studies (Cao, Su, Liu, & Gao, 2007; Fisoun et al., 2011; Huang et al., 2009; Siomos, Dafouli, Braimiotis, Mouzas, & Angelopoulos, 2008). It seems then that, rather than being selected on its scientific merit, the YDQ may have become popular simply because it was the first set of criteria to be proposed in an empirical paper.

After developing the YDQ, Young (1999) admitted that further research was needed to determine the construct validity and clinical value of the criteria. However, since that time, only minimal steps have been taken to achieve this. In one of the first studies to analyse the psychometric properties of the YDQ, Johansson and Götestam (2004) administered the criteria to a sample of 3,237 Norwegian adolescents. They
reported that the YDQ had a split-half reliability of 0.73 and a Cronbach’s alpha of 0.71. Principal Component Analysis (PCA) identified a first component that explained 36.5% of the variance, and all of the eight criteria were found to be significantly intercorrelated. Further consistency testing in Asian (Cao & Su, 2007), Greek (Fisoun et al., 2011), and Australian samples (Dowling & Quirk, 2009) indicate that Cronbach’s alpha levels for the YDQ range between 0.72 and 0.79. These results suggest that the YDQ has adequate reliability and that the internal consistency of the YDQ is not largely affected as a result of cultural differences. However, as evidence of validation of these criteria is minimal, further research in this area is required.

Another issue associated with the use of the YDQ (Young, 1996) is that there has been inconsistency in regards to an appropriate cut-off point for a diagnosis of Internet Addiction. While some studies adhere to Young’s original cut-off score of five (e.g., Huang et al., 2009; Siomos et al., 2008), others use modified scoring techniques suggested in subsequent papers. For instance, Johansson and Götestam (2004) propose that, in addition to the cut-off score of 5 or more criteria for a diagnosis of Internet Addiction, a second cut-off score of 3-4 criteria could be used to identify at-risk individuals. However, Dowling and Quirk (2009) evaluated the utility of the YDQ to discriminate between individuals scoring 3-4 from those scoring 5 and above based on a number of variables. They found that there were no significant differences between the two groups in regard to time spent on the Internet, history of use, Internet activities engaged in, and psychological dysfunction. As a result, those authors questioned the viability of the different diagnostic categories proposed by Johansson and Götestam.

Beard and Wolf (2001) have suggested another, much stricter, cut-off procedure. These authors posited that the first five criteria of the YDQ (Young, 1996) were not sufficient to identify the presence of an addiction. To support their argument, they provided a hypothetical example of an individual who appears to be experiencing preoccupation, tolerance, withdrawal, and loss of control, but whose level of functioning may not be impaired because of it. In their words:

[A] new mother may be preoccupied with thoughts of her new baby. She may desire increased amount of time with her child. She may feel restless, moody, depressed, or irritable when she leaves the child with a family member or at a day care center. Finally she may interact with the child for longer periods of time than originally intended, such as planning on rocking the child until the child sleeps, but the mother continues to rock. Would we say that this new mother is addicted to her newborn child? (p. 380)

Therefore, Beard and Wolf suggested that addiction should only be diagnosed when
all of the first five criteria of the YDQ are present, in conjunction with at least one of the three final criteria relating to impairment of functioning. To date, there is an absence of empirical evidence supporting the utility of these modified criteria.

### 2.3.3. Obsessive-Compulsive Disorder

Rather than aligning with either Substance-Related Disorders or Pathological Gambling, Shapira et al. (2000) hypothesised that Internet Addiction may in fact mirror obsessive-compulsive behaviour. They designed three diagnostic criteria for Internet Addiction based on selected items from the *DSM-IV* (APA, 1994) entry for Obsessive-Compulsive Disorder (Appendix D): (a) uncontrollable Internet use, (b) markedly distressing or time-consuming use that results in social, occupational or financial difficulties and (c) the behaviour is not solely present during hypomanic or manic symptoms. Shapira et al. tested these criteria using a sample of 20 participants who had either self-diagnosed as problematic Internet users, or had been referred to the study by clinicians. After conducting diagnostic interviews the authors concluded that, while all of the participants met the diagnostic criteria for Impulse-Control Disorder (Not Elsewhere Specified), only three met the criteria for Obsessive Compulsive Disorder.

Based on these results, Shapira et al. (2003) wrote a follow-up paper proposing that the *DSM-IV-TR* (APA, 2000) criteria for Impulse-Control Disorders were more appropriate for classifying Internet Addiction than the criteria for Obsessive-Compulsive Disorder. They provided case-study information from their initial study to support their position, but also argued that, as that several heterogeneous disorders were classified as Impulse-Control Disorders (i.e., Pathological Gambling, Kleptomania etc.), this allowed scope for the inclusion of Internet Addiction. Their new criteria were as follows:

A. **Maladaptive preoccupation with Internet use**, as indicated by at least one of the following:

1. Preoccupations with use of the Internet that are experienced as irresistible.
2. Excessive use of the Internet for periods of time longer than planned.

B. **The use of the Internet or the preoccupation with its use causes clinically significant distress or impairment in social, occupational, or other important areas functioning.**

C. **The excessive Internet use does not occur exclusively during periods of**
As can be seen, these new criteria tapped into preoccupation and excessive use. To date, these authors have not published a study detailing the effectiveness of these criteria, so their usefulness is untested.

2.3.4 Multiple sources. In recent times, the most common method of designing criteria for diagnosing Internet Addiction appears to be selecting and combining items from several existing disorders, rather than one alone (i.e., Aboujaoude et al., 2006; Ko et al., 2009; Tao et al., 2010). Of these, the criteria proposed by Tao et al. appear to be the most promising.

Tao et al. (2010) developed their criteria for Internet Addiction based on a combination of clinical experience and several other proposed diagnostic criteria for Internet Addiction (i.e., Griffiths, 1999; Ko et al., 2000; Shapira et al., 2000; Young, 1996). The researchers subjected these criteria to a three-stage process of development, validation, and testing for clinical reliability. The final criteria were:

1. **Symptom criterion**

   All the following must be present:
   a) Preoccupation with the Internet (thinks about previous online activity or anticipates next online session)
   b) Withdrawal, as manifested by a dysphoric mood, anxiety, irritability and boredom after several days without Internet activity.

   And at least one (or more) of the following:
   c) Tolerance, marked increase in Internet use required to achieve satisfaction
   d) Persistent desire and/or unsuccessful attempts to control, cut back or discontinue Internet use
   e) Continued excessive use of Internet despite knowledge of having a persistent or recurrent physical or psychological problem likely to have been caused or exacerbated by Internet use
   f) Loss of interests, previous hobbies, entertainment as a direct result of, and with the exception of, Internet use
   g) Uses the Internet to escape or relieve a dysphoric mood (e.g. feelings of helplessness, guilt, anxiety

2. **Exclusion criterion**

   Excessive Internet use is not better accounted for by psychotic
3. **Clinically significant impairment criterion**
   Functional impairments (reduced social, academic, working ability), including loss of a significant relationship, job, educational or career opportunities

4. **Course criterion**
   Duration of Internet Addiction must have lasted for an excess of 3 months, with at least 6 hours of Internet usage (non-business/non-academic) per day

Tao et al. (2010) tested the incidence rates of their criteria using a sample of 110 clinical patients who had been independently diagnosed as Internet addicted by two psychiatrists. The results revealed that criterion 1a (96.4%) and 1b (95.5%) were the most frequently endorsed symptoms, while criteria 1c to 1h were endorsed slightly less frequently (72.7% - 86.4%). All of the participants endorsed at least three of the eight symptoms, and the majority (95.5%) endorsed both criterion 1a and 1b together. Further validation studies using a random sample of 405 middle school students revealed very high diagnostic sensitivity (89.7%), specificity (100%) and accuracy rates (99.26%) when criterion 1a and 1b were both endorsed in conjunction with at least one other criterion from 1c to 1h. Furthermore, inter-rater reliability analysis revealed that there was a 98% consistency rate between psychiatrists who had independently diagnosed the same individual using the proposed criteria.

Through subjecting their criteria to statistical scrutiny, and by using more rigorous research methods, Tao et al. (2010) have done more to prove the diagnostic accuracy of their Internet Addiction criteria than the other previously discussed researchers. Furthermore, their decision to be influenced by clinical experience may have the added advantage of enhancing the content validity of their criteria. However, as this study was targeted towards Asian participants, the generalizability of these results to the wider population is unknown. Despite this limitation, these authors appear to be taking important steps towards providing a valid and reliable set of diagnostic criteria for Internet Addiction.

### 2.4. Measurement

As discussed in the previous section, early Internet Addiction researchers tended to borrow diagnostic criteria from an existing disorder within the *DSM-IV*...
(APA, 1994), such as Substance Dependence or Pathological Gambling. For the most part, the early development of measures of Internet Addiction also involved a similar process. Three of the earliest Internet Addiction measures were the Internet Related Addictive Behavior Inventory (IRABI; Brenner, 1997), the IAT (Young, 1998), and the Internet Related Problems Scale (IRPS; Armstrong, Phillips, & Saling, 2000). Both the IRABI and the IRPS were based on DSM-IV criteria for Substance-Related Disorders, while the IAT appears to be influenced\(^4\) by at least some of the DSM-IV criteria for Pathological Gambling. However, when it came to developing a measure of Internet Addiction, early researchers often chose to include additional items beyond those provided in diagnostic criteria. For example, the IAT includes items such as “How often do you check your email before something else that you need to do?”, and “How often do you form new relationships with fellow online users?” Similarly, the IRABI includes the items “If it weren’t for my computer I wouldn’t have any fun at all”, and “Most of my friends I know from the Net”.

The creators of these measures (Armstrong et al., 2000; Brenner, 1997; Young, 1998) did not explain why these additional items were chosen or included. A potential explanation may be that, when developing a measure of a construct, it is beneficial to have more than one item that taps into a particular symptom (Clark & Watson, 1995). Traditionally, when conducting this process, scholars would base these additional items on theory or other relevant evidence (Worthington & Whittaker, 2006). This does not seem to have occurred with Internet Addiction, as there was no theory proposed at the time. Unfortunately, this means that the genesis of some of the items in these early measures is unclear. This casts a certain level of doubt over their relevance to the construct of Internet Addiction. In fact, Griffiths (1999) criticises the inclusion of such items, arguing that they may not relate to addiction at all.

As Davis et al. (2002) point out, “one of the first steps in establishing a systematic research program on a new phenomenon is to develop, refine and validate a measure, and then use it to explore the nature of the construct itself” (p. 332). In the opinion of Davis et al., this process has not been adhered to stringently enough in the case of Internet Addiction. They argue that the early measures of this construct were based on small samples, have been subjected to limited psychometric testing, and were completely atheoretical. They further posit that most measures

\(^4\) Young (1998) did not provide detailed information about the development of the IAT, however the items appear to be closer to Pathological Gambling criteria than Substance-Related criteria. Young had previously also based the YDQ on Pathological Gambling criteria, so it makes sense that she would do the same with the IAT. This is discussed further in Section 2.4.1.
were unidimensional, “despite significant evidence of various associated dimensions” (p. 322). Furthermore, Griffiths (2000b) has argued that proposed measures “have no measure of severity, have no temporal dimension, have a tendency to overestimate the prevalence of problems, and take no account of the context of Internet use” (pp. 416-417).

In the last 13 years, several additional Internet Addiction measures have been created, such as the Online Cognitions Scale (OCS; Davis et al., 2002), the Generalised Problematic Internet Use Scale (GPIUS; Caplan, 2002), the Problematic Internet Use Questionnaire (PIUQ; Thatcher & Goolam, 2005), the Internet Addiction Scale (IAS; Nichols & Nicki, 2004), and the Compulsive Internet Use Scale (CIUS; Meerkerk et al., 2009). In most cases, the basis for item development in these newer scales has been reported in more detail than it was in the early years of research. Rather than relying solely on DSM-IV-TR (APA, 2000) criteria, item development has stemmed from various sources, such as theory (Caplan, 2002), examples from literature (Davis et al., 2002), and expert opinion (Ceyhan, Ceyhan, & Gurcan, 2007). This information is discussed in more detail in Chapter 6. However, despite the advancements in measurement that have taken place over the years, the IAT (Young, 1998) is the most commonly used scale in research studies of Internet Addiction today (i.e., Hawi, 2012; Kittinger et al., 2012). This is surprising, considering the criticisms that have been levelled at early Internet Addiction measures, particularly the IAT. However, because it is the most popular measure of Internet Addiction, a detailed discussion of the IAT is provided below.

2.4.1 The Internet Addiction Test. Like the YDQ (Young, 1996), the IAT was developed by Kimberley Young (1998). It was first presented as a quiz in a self-help manual for Internet addicts titled, Caught in the Net: How to Recognize the Signs of Internet Addiction – and a Winning Strategy for Recovery. The IAT consists of 20 statements describing behaviour presumably symptomatic of Internet Addiction. These statements all begin with the words "How often do you..." and are answered using a 5-point Likert scale, where 1 = "Not at all", 2 = "Rarely", 3 = "Occasionally", 4 = "Often", and 5 = "Always". The included behaviours are:

1. Staying online longer than intended
2. Neglecting household chores to spend more time online
3. Preferring the excitement of the Internet to intimacy with a partner

Refer to systematic review chapter (Chapter 6).
4. Forming new relationships with fellow online users
5. Hearing others complain about the amount of time the individual spends online
6. Grades or school-work suffering because of time spent online
7. Checking email before something else that needs to be done
8. Job performance or productivity suffering because of the Internet
9. Becoming defensive or secretive when asked about online activity
10. Blocking out disturbing thoughts about their life with soothing thoughts of the Internet
11. Finding themselves anticipating when they will go online again
12. Fearing that life without the Internet would be boring, empty, and joyless
13. Snapping, yelling, or acting annoyed if someone bothers them while they are online
14. Losing sleep due to late night logins
15. Feeling preoccupied with the Internet when offline, or fantasising about being online
16. Saying to themselves "just a few more minutes" when online
17. Trying to cut down the amount of time spent online and failing
18. Trying to hide how long they've been online
19. Choosing to spend more time online over going out with others
20. Feeling depressed, moody, or nervous when offline, and having this feeling go away once back online

The IAT is designed to be self-administered and scored, with three total score categories provided by Young (1998). Individuals scoring between 20-39 points are not considered to have issues with their Internet use, individuals scoring 40-69 points are at risk of becoming Internet addicted, and individuals scoring 70-100 points are considered to be addicted. Young asserts that readers scoring in the latter point range should address their Internet behaviour immediately.

As previously mentioned, Young (1998) did not explain how she developed the items on the IAT. However, it is apparent that some of the items are based on criteria found in the YDQ. For example, item 15 asks about preoccupation with the Internet, and item 18 refers to concealment of use. Both of these themes are also included in the YDQ (see Section 2.3.2). In addition, items 3, 5, 6, 8, 14, and 19 could be said to relate to the potential for negative outcomes to occur in the areas of relationships, jobs, and education, which aligns with criterion 6 of the YDQ. However, as pointed out earlier, there are several items (e.g., 3, 7, 12, 13) that do not seem to be based on the YDQ at all, nor do they appear to have a clear basis in the psychological literature. It is likely that these items were derived from qualitative
studies of Internet Addiction performed by Young, as in her book she provides many short case studies of individuals with suspected Internet Addiction.

Due to the fact that the IAT was not presented in an academic paper, Young (1998) does not provide detailed information about item development, nor does she present any psychometric testing on the measure. Furthermore, there is no evidence that she tested the utility of the measure in any empirical way prior to publication, nor does she discuss the usefulness of the cut-off scores. Based on these facts, it appears as if Young did not intend this measure to be used for research purposes. Instead, it seems she may have simply considered it to be a non-diagnostic, self-assessment scale to enlighten potential Internet addicts of their problematic behaviour. This assertion is supported by the fact that Young did not use the IAT in an empirical study until nine years after its creation (Young, 2007), by which time it had been subjected to factor analysis and reliability testing by Widyanto and McMurrnan (2004).

Regardless of the limitations associated with the IAT, many researchers have chosen to use this instrument, and adhere to its seemingly arbitrary cut-off scores, to measure Internet Addiction in empirical studies (evidence of this is presented in Chapter 6). However, due to its origins, the utility of the IAT as a diagnostic instrument should be questioned. At this point, several studies (e.g., Chang & Law, 2008; Widyanto, Griffiths, & Brunsdon, 2011; Widyanto & McMurrnan, 2004) have performed factor analysis of the IAT, but there has been limited consistency between results. This may be due to the different types of methodology and analysis that were used between studies. Furthermore, different factors structures have been reported in each study, and none have been replicated. This implies that the factor structures that have been proposed so far lack stability across populations. Table 2.2 provides factor analysis and psychometric information about the IAT from three such studies.

Given the information presented here, it appears that further research is needed in order to confidently state that the IAT has a clear factor structure and sound psychometric properties. In addition, as this measure lacks a strong theoretical basis, its usefulness is still in doubt. As a result, it is a curious choice for researchers looking for a universal measure of Internet Addiction. It is certainly also a long way from being a gold-standard measure of Internet Addiction. Perhaps one of the biggest concerns with the IAT is that it was not derived from theory, which raises questions about its ability to achieve construct validity.
Table 2.2

Factor Analysis, Internal Consistency and Validity Testing Results from Three Studies of the Internet Addiction Test

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Sample</th>
<th>Factors</th>
<th>Explained Variance (%)</th>
<th>Internal Consistency</th>
<th>Validity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Widyanto, Griffiths, &amp; Brunsden</td>
<td>2011</td>
<td>225 Internet users (69 men, 156 women)</td>
<td>1. Psychological/Emotional Conflict, 2. Time Management Problems, 3. Mood Modification</td>
<td>Total: 56.3</td>
<td>Psychological/Emotional Conflict: 42.7</td>
<td>High values for all three factors. None reported</td>
</tr>
</tbody>
</table>
2.5. Summary

As this chapter has shown, the foundation of Internet Addiction research has been less than ideal. Researchers have disagreed right from the start about even the most basic components of a psychological construct. These issues have clearly restricted the achievement of construct validity for Internet Addiction. Through the discussion presented within this chapter, it seems that a lack of clarity regarding a definition for addiction and a lack of a strong theoretical model have caused significant problems for Internet Addiction researchers. Unfortunately, these issues have undermined every attempt to produce a relevant description or method of assessment for this construct.

One of the most salient issues affecting much Internet Addiction research is the general failure to use well-validated methods of assessment, whether they are measures or diagnostic criteria. Despite the fact there may be more appropriate methods of assessment available, most researchers tend to choose the YDQ or the IAT, seemingly because they have the most academic presence. However, as shown here, academic presence does not guarantee that a measure has strong construct validity.

The issues underlying Internet Addiction research are certainly considerable. However, if we look past the conceptual chaos, there is a body of qualitative research indicating that Internet use can become problematic for some people, to the point of causing severe negative impacts in their lives (e.g., Griffiths, 2000a; Young, 1998). Furthermore, as will be shown in Chapter 3, empirical research supports the notion that some Internet users do develop symptoms that are similar to addictive disorders, such as Substance Use Disorder. Therefore, while it is important to recognise that there are serious limitations and inconsistencies associated with Internet Addiction research, it is also necessary to acknowledge that there are people who have been negatively impacted by their Internet use, and who may need help to get their lives back on track. To support the latter view, Chapter 3 presents a review of Internet Addiction research.
Chapter 3

Literature Review of Internet Addiction

In Chapter 2, the conceptual chaos underlying Internet Addiction research was examined. Unfortunately, the existence of this chaos makes it difficult to compare studies in a traditional literature review. As stated by King et al. (2011):

Proponents of an Internet Addiction diagnosis appear to be road-blocked by the lack of a knowledge base demonstrating consistent findings. In particular, the lack of a common framework for Internet Addiction has prevented a unified research effort, such that many published studies differ conceptually and methodologically. A side-by-side comparison of findings thus becomes difficult, if not impossible. (p. 1186)

Despite these concerns, it is imperative to examine research relating to topics such as prevalence, predictors, forms, and aetiology, as this strengthens the legitimacy of the construct of Internet Addiction. Therefore, the present chapter attempts to untangle the methodological and conceptual differences that exist across studies to review the literature on Internet Addiction.

The present chapter begins with an analysis of the literature regarding prevalence of Internet Addiction. This topic leads into a discussion of some of the predictors of Internet Addiction, with a specific focus on variables relating to social interaction. Focusing on the social factors associated with Internet Addiction is relevant to Facebook Addiction, as Facebook is a social networking site. This focus on social activity necessitates that a distinction be made between addiction to different forms of Internet activities, such as online gambling, and online socialising. The final section in this chapter relates to theory surrounding the development of Internet Addiction. This is a particularly important topic, one that many Internet Addiction researchers neglect.

3.1 Prevalence of Internet Addiction

Within this section, the discussion of prevalence studies will be organised according to the age range of participants (i.e. high school students, university students, general population), but a focus on locality will also be maintained. This method of organisation allows for a more focused view of prevalence patterns. It also reveals which measures, criteria, and cut-off points are used most often in certain
regions of the world.

**3.1.1. High school students.** Table 3.1 presents the prevalence rates of Internet Addiction in high school students in various countries across the world. The majority of these studies have recruited participants directly from high schools, but some European studies targeted 12-18 year olds via telephone (i.e., Johansson & Götestam, 2004) and postal surveys (i.e., Kaltiala-Heino, Lintonen, & Rimpelä, 2004). In terms of assessing Internet Addiction, there are four main measures or criteria used: the YDQ (Young, 1996), the IAT (Young, 1998), the OCS (Davis, 2001) and Chen's *Internet Addiction Scale* (CIAS; Chen, Weng, Su, Wu, & Yang, 2003). The latter is a 26-item self-report scale that was created to measure Internet Addiction in Chinese populations. The CIAS was based on Young’s model of Internet Addiction (Li & Chung, 2006), and has been reported to tap into tolerance, compulsive use, withdrawal, negative impacts, and time management (Kuss, Griffiths, Karila, & Billeux, *in press*). It has a cut-off score of 64, and has demonstrated internal consistency of the both the total scale and subscales (Yen, Yen, Chen, Chen, & Ko, 2007).

**3.1.1.1. Australia.** Only one study was found that measured the prevalence of Internet Addiction among Australian high school students. Thomas and Martin (2010) used the YDQ, and reported prevalence rates of 5.2%. When comparing this result to other studies that relied on the YDQ (see Table 3.1), it seems that Australian students have a similar incidence of Internet Addiction to many European countries (i.e., Durkee et al.; Siomos et al., 2008). The same authors also collected data from university students. Those results will be discussed in Section 3.1.2.

**3.1.1.2. North America.** As Table 3.1 shows, there has been limited research looking at prevalence estimates of Internet Addiction in North American adolescents. In fact, a systematic review of prevalence studies among US youth reported that they could not find a single research study that measured prevalence in this population (Moreno, Jelenchick, Cox, Young, Christakis, 2011). However, in a dissertation study, Pawlak (2002) examined the correlates of Internet Addiction in adolescents and found that 17.80% of the sample was Internet addicted. This figure is alarmingly high and may either reflect leniency in the cut-off score or a biased sample. Unfortunately, as there are no other prominent studies that have measured Internet Addiction in US adolescents, this hypothesis has not been confirmed. Clearly, further research should focus on measuring the prevalence of Internet Addiction in large samples of high school students in the USA.
Table 3.1

*Prevalence of Internet Addiction in High School Students*

<table>
<thead>
<tr>
<th>Location</th>
<th>Author(s)</th>
<th>Year</th>
<th>Sample Size</th>
<th>Method of Assessment</th>
<th>Diagnostic Cut-off</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Thomas &amp; Martin</td>
<td>2010</td>
<td>990</td>
<td>YDQ</td>
<td>≥5</td>
<td>5.2</td>
</tr>
<tr>
<td>North America</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>Pawlak</td>
<td>2002</td>
<td>202</td>
<td>OCS</td>
<td>One standard deviation above the mean</td>
<td>17.8</td>
</tr>
<tr>
<td>Europe</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finland</td>
<td>Kaltiala-Heino et al.</td>
<td>2004</td>
<td>7,292</td>
<td>Selected items from pathological gambling and substance dependency criteria</td>
<td>≥4</td>
<td>3.1</td>
</tr>
<tr>
<td>Finland</td>
<td>Sinkkonen, Puhakka, &amp; Meriläinen</td>
<td>2014</td>
<td>475</td>
<td>IAT</td>
<td>≥70</td>
<td>1.3</td>
</tr>
<tr>
<td>Norway</td>
<td>Johansson and Götestam</td>
<td>2004</td>
<td>3,237</td>
<td>YDQ</td>
<td>≥5</td>
<td>1.98</td>
</tr>
<tr>
<td>Italy</td>
<td>Pallanti, Bernardi, &amp; Quercioli</td>
<td>2006</td>
<td>275</td>
<td>IAT</td>
<td>≥70</td>
<td>5.4</td>
</tr>
<tr>
<td>Italy</td>
<td>Villella et al.</td>
<td>2011</td>
<td>2,853</td>
<td>IAT</td>
<td>≥70</td>
<td>1.2</td>
</tr>
<tr>
<td>Greece</td>
<td>Siomos et al.</td>
<td>2008</td>
<td>2,200</td>
<td>YDQ</td>
<td>≥5</td>
<td>5.9</td>
</tr>
<tr>
<td>Greece (Island of Kos)</td>
<td>Fisoun et al.</td>
<td>2011</td>
<td>1,221</td>
<td>YDQ</td>
<td>≥5</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>IAT</td>
<td>≥70</td>
<td>6.2</td>
</tr>
<tr>
<td>Location</td>
<td>Author(s)</td>
<td>Year</td>
<td>Sample Size</td>
<td>Method of Assessment</td>
<td>Diagnostic Cut-off</td>
<td>Prevalence (%)</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>------------------------------------------------</td>
<td>------</td>
<td>-------------</td>
<td>-------------------------------------------</td>
<td>--------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Greece</td>
<td>Stavropoulos, Alexandraki, &amp; Motti-Stefanidi</td>
<td>2013</td>
<td>2,090</td>
<td>YDQ</td>
<td>≥5</td>
<td>3.12</td>
</tr>
<tr>
<td>Austria, Estonia, France, Germany, Hungary, Ireland, Israel, Italy, Romania, Slovenia, Spain</td>
<td>Durkee et al.</td>
<td>2012</td>
<td>11,956</td>
<td>YDQ</td>
<td>≥5</td>
<td>4.4</td>
</tr>
<tr>
<td>UK</td>
<td>Lopez-Fernandez, Honrubia-Serrano, Gibson, &amp; Griffiths Kuss, van Rooij, Shorter, Griffiths, &amp; Mheen</td>
<td>2014</td>
<td>1097</td>
<td>Problematic Internet Entertainment Use Scale for Adolescents (PIEUSA)</td>
<td>≥172</td>
<td>5.2</td>
</tr>
<tr>
<td>The Netherlands</td>
<td></td>
<td>2013</td>
<td>3105</td>
<td>Compulsive Internet Use Scale (CIUS)</td>
<td>≥28</td>
<td>3.7</td>
</tr>
<tr>
<td>Asia</td>
<td>Lin &amp; Tsai</td>
<td>1999</td>
<td>615</td>
<td>YDQ</td>
<td>≥5</td>
<td>10.8</td>
</tr>
<tr>
<td>Taiwan</td>
<td>Tsai &amp; Lin</td>
<td>2001</td>
<td>753</td>
<td>YDQ</td>
<td>≥5</td>
<td>12</td>
</tr>
<tr>
<td>Taiwan</td>
<td>Ko et al.</td>
<td>2006</td>
<td>3,412</td>
<td>CIAS</td>
<td>≥64</td>
<td>20.7</td>
</tr>
<tr>
<td>Taiwan</td>
<td>Yang &amp; Tung</td>
<td>2007</td>
<td>1,708</td>
<td>YDQ</td>
<td>≥5</td>
<td>13.8</td>
</tr>
<tr>
<td>Taiwan</td>
<td>Yen et al.</td>
<td>2007</td>
<td>3,480</td>
<td>CIAS</td>
<td>≥64</td>
<td>20.7</td>
</tr>
<tr>
<td>Taiwan</td>
<td>Yen, Ko, Yen, Wu, Yang</td>
<td>2007</td>
<td>2,114</td>
<td>CIAS</td>
<td>≥64</td>
<td>17.9</td>
</tr>
<tr>
<td>Taiwan</td>
<td>Ko, Yen, Yen, Lin, Yang</td>
<td>2007</td>
<td>517</td>
<td>CIAS</td>
<td>≥64</td>
<td>17.7</td>
</tr>
<tr>
<td>Location</td>
<td>Author(s)</td>
<td>Year</td>
<td>Sample Size</td>
<td>Method of Assessment</td>
<td>Diagnostic Cut-off</td>
<td>Prevalence (%)</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------------------------</td>
<td>------</td>
<td>-------------</td>
<td>----------------------</td>
<td>--------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Taiwan</td>
<td>Chang, Chiu, Lee, Chen, Miao</td>
<td>2014</td>
<td>2315</td>
<td>CIAS</td>
<td>≥64</td>
<td>15.8</td>
</tr>
<tr>
<td>India</td>
<td>Nalwa &amp; Anand</td>
<td>2003</td>
<td>100</td>
<td>OCS</td>
<td>Half a standard deviation above the mean</td>
<td>18</td>
</tr>
<tr>
<td>India</td>
<td>Yadav, Banwari, Parmar, &amp; Maniar</td>
<td>2013</td>
<td>621</td>
<td>IAT</td>
<td>≥50</td>
<td>11.8</td>
</tr>
<tr>
<td>Korea</td>
<td>Kim et al.</td>
<td>2006</td>
<td>1,573</td>
<td>IAT</td>
<td>≥70</td>
<td>1.6</td>
</tr>
<tr>
<td>Korea</td>
<td>Jang, Hwang, &amp; Choi</td>
<td>2006</td>
<td>912</td>
<td>IAT</td>
<td>≥70</td>
<td>4.1</td>
</tr>
<tr>
<td>Korea</td>
<td>Ha et al.</td>
<td>2007</td>
<td>452</td>
<td>IAT</td>
<td>≥50</td>
<td>30.8</td>
</tr>
<tr>
<td>China</td>
<td>Cao &amp; Su</td>
<td>2007</td>
<td>2,620</td>
<td>YDQ</td>
<td>5 +1</td>
<td>2.4</td>
</tr>
<tr>
<td>China</td>
<td>Lam, Peng, Mai &amp; Jing</td>
<td>2009</td>
<td>1,618</td>
<td>IAT</td>
<td>≥80</td>
<td>0.6</td>
</tr>
<tr>
<td>China</td>
<td>Tang, Yu, Du, Ma, Zhang, &amp; Wang</td>
<td>2014</td>
<td>755</td>
<td>IAT</td>
<td>≥50</td>
<td>6.0</td>
</tr>
<tr>
<td>Iran</td>
<td>Ghassemzadeh, Shahraray, &amp; Moradi</td>
<td>2008</td>
<td>977</td>
<td>IAT</td>
<td>≥70</td>
<td>3.79</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>Fu, Chan, Wong, &amp; Yip</td>
<td>2010</td>
<td>208</td>
<td>YDQ</td>
<td>≥5</td>
<td>6.7</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>Yu &amp; Shek</td>
<td>2013</td>
<td>1: 3,325</td>
<td>IAT (10 item)</td>
<td>≥4</td>
<td>1: 26.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2: 3,638</td>
<td></td>
<td></td>
<td>2: 26.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3: 4,106</td>
<td></td>
<td></td>
<td>3: 22.5</td>
</tr>
<tr>
<td>Lebanon</td>
<td>Hawi</td>
<td>2012</td>
<td>833</td>
<td>IAT</td>
<td>≥70</td>
<td>4.2</td>
</tr>
</tbody>
</table>
3.1.1.3. Europe. In Europe, there appears to be considerably more research looking at Internet Addiction among adolescents than there is from Australia and North America. Typically, European studies employ either the YDQ or the IAT to measure Internet Addiction. When the YDQ was used in European samples, the incidence of Internet Addiction ranged from 1.98% in Norway to 11% in Greece. When the IAT was used, prevalence rates ranged from 1.2% in Italy (Villella et al., 2011) to 6.2% in Greece (Fisoun et al., 2011). It is interesting to note that the highest reported prevalence rate using both the YDQ and the IAT have both come from the same sample, which was from the Greek island of Kos (Fisoun et al., 2011). This study also highlights the propensity for the YDQ to result in higher prevalence rates than the IAT, which is a trend worthy of further research.

3.1.1.4. Asia. In Table 3.1, it is clear that the majority of prevalence studies originate from Asia. These studies generally hail from two countries: China (including Hong Kong and Taiwan), and The Republic of Korea. Some of these studies have measured Internet Addiction using translated versions of the IAT and the YDQ. However, in Taiwan, researchers often employ the CIAS. Interestingly, this measure appears to produce higher prevalence rates than the YDQ in Taiwanese studies, which may suggest that it is either too lenient, or that the YDQ is not lenient enough. Given than the CIAS was developed specifically for use in Chinese populations, it is more likely that the latter is true. In studies where the YDQ was used, prevalence rates have ranged from 2.4% in China (Cao & Su, 2007) to 13.8% in Taiwan (Yang & Tung, 2007). In Cao and Su’s study, the low prevalence rate is likely due to the fact that they employed a stricter cut-off score than usual, as recommended by Beard and Wolf⁶ (2001).

In regards to the IAT, this measure has mainly been used in Korean studies. Interestingly, even though they adhered to the same cut-off scores, Kim et al. (2006) and Jang et al. (2006) reported quite different prevalence rates, at 1.6% and 4.1% respectively. This discrepancy may be attributed to sampling differences, as Kim et al. only recruited 15-16 year olds, while the sample used by Jang et al. consisted of students in the 7th to 12th grades. A third Korean study by Ha et al. (2007) reported a much larger prevalence rate of 30.8%; however, these authors used a more lenient cut-off score of 50 and above. In a more recent paper from Hong Kong, Yu and Shek (2013) used a 10-item version of the IAT. These researchers conducted a longitudinal study in three waves over a period of three years. Prevalence rates in

⁶ Beard and Wolf’s (2001) proposed cut-off score is discussed in Section 2.3.2.
these samples were high, ranging from 22.5% to 26.7%. Given that a previous Hong Kong study (Fu et al., 2010) using the YDQ had reported prevalence rates of 6.7%, it is possible that the 10-item version of the IAT is too lenient.

**3.1.2. University students.** Table 3.2 presents data relating to prevalence rates of Internet Addiction in university students. This selection of studies originates from countries within Australia, Africa, North America, Europe, and Asia. Looking at Table 3.2, there is less consistency in regards to the methods of assessment used in this selection of studies than there was for high school samples (see Table 3.1). Even though there are fewer studies represented in Table 3.2 than in 3.1, there are twelve different methods of assessment used. This reflects the higher representation of studies from the USA included in Table 3.2; looking at this particular data set, it seems that there is no widely accepted measure of Internet Addiction in that country. In contrast, Table 3.1 revealed a clear preference for certain measures in some countries, such as the IAT in Korea and the CIAS in Taiwan. The lack of a similar pattern in Table 3.2 makes it more difficult to compare the reported prevalence rates of Internet Addiction in university students.

**3.1.2.1. Australia.** Only two studies measured prevalence of Internet Addiction amongst Australian university students. Although both of these studies used different measures of Internet Addiction, their prevalence rates are similar; Wang reported 4%, while Thomas and Martin (2010) reported 3.2%. In comparison to the sample of Australian high school students discussed above, it appears as if university students had slightly lower rates of Internet Addiction. However, further research is needed to determine whether these results could be replicated. Given that Australia is a world-leader in some Internet-related psychological fields, such as cyberbullying (Edith Cowan University, 2010) and online therapeutic interventions (Klein, 2010), the lack of Internet Addiction research in this country is surprising.

In 2008, Zhang, Amos and McDowell performed a study of university students in the USA and China using the same criteria as Wang (2001). Those authors also reported a 4% prevalence rate of Internet Addiction in the USA sample, which indicates that rates of Internet Addiction in Australian university students may be similar to those from the USA; however, further research using similar measures and cut off points is needed to confirm this.
<table>
<thead>
<tr>
<th>Location</th>
<th>Author(s)</th>
<th>Year</th>
<th>Sample Size</th>
<th>Method of Assessment</th>
<th>Diagnostic Cut-off</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Thomas &amp; Martin</td>
<td>2010</td>
<td>705</td>
<td>YDQ</td>
<td>≥5</td>
<td>3.2</td>
</tr>
<tr>
<td>Africa</td>
<td>Adiele &amp; Olatokun</td>
<td>2014</td>
<td>1022</td>
<td>IAT</td>
<td>≥70</td>
<td>3.3</td>
</tr>
<tr>
<td>North America</td>
<td>Scherer</td>
<td>1997</td>
<td>531</td>
<td>DSM-IV criteria for substance-related disorders</td>
<td>≥3</td>
<td>13</td>
</tr>
<tr>
<td>USA</td>
<td>Morahan-Martin &amp; Schumacher</td>
<td>2000</td>
<td>227</td>
<td>PIU scale</td>
<td>≥4</td>
<td>8.1</td>
</tr>
<tr>
<td>USA</td>
<td>LaRose, Lin, &amp; Eastin</td>
<td>2003</td>
<td>465</td>
<td>Self-developed items based on previous research</td>
<td>≥5 and admits that Internet had interfered with daily life</td>
<td>4.7</td>
</tr>
<tr>
<td>USA</td>
<td>DiNicola</td>
<td>2003</td>
<td>731</td>
<td>Cognitive Behavioural Checklist</td>
<td>≥4</td>
<td>7</td>
</tr>
<tr>
<td>USA</td>
<td>Fortson, Scotti, Chen, Malone, Del Ben</td>
<td>2007</td>
<td>411</td>
<td>DSM-IV-TR criteria for substance-related disorders</td>
<td>Ratings at high point for each item</td>
<td>1.2</td>
</tr>
<tr>
<td>USA</td>
<td>Zhang, Amos, &amp; McDowell</td>
<td>2008</td>
<td>171</td>
<td>Same as Wang (2001)</td>
<td>≥4</td>
<td>4</td>
</tr>
<tr>
<td>Location</td>
<td>Author(s)</td>
<td>Year</td>
<td>Sample Size</td>
<td>Method of Assessment</td>
<td>Diagnostic Cut-off</td>
<td>Prevalence (%)</td>
</tr>
<tr>
<td>----------</td>
<td>----------------------------------------</td>
<td>------</td>
<td>-------------</td>
<td>-----------------------------------------------------------</td>
<td>--------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Europe</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td>Neimz, Griffiths, &amp; Banyard</td>
<td>2005</td>
<td>371</td>
<td>PIU scale</td>
<td>≥4</td>
<td>18.3</td>
</tr>
<tr>
<td>UK</td>
<td>Kuss, Griffiths, &amp; Binder</td>
<td>2013</td>
<td>2257</td>
<td>Assessment for Computer and Internet Addiction Screener (AICA-S)</td>
<td>≥13.5</td>
<td>3.2</td>
</tr>
<tr>
<td>Spain</td>
<td>Jenaro, Flores, Gomez-Vela, Gonzalez-Gil, Cabello</td>
<td>2007</td>
<td>337</td>
<td>Pathological Gambling criteria</td>
<td>≥5</td>
<td>6.2</td>
</tr>
<tr>
<td>Greece</td>
<td>Frangos, Frangos, &amp; Sotiropoulos</td>
<td>2011</td>
<td>2,293</td>
<td>YDQ</td>
<td>≥4</td>
<td>12</td>
</tr>
<tr>
<td>Asia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taiwan</td>
<td>Chou &amp; Hsiao</td>
<td>2000</td>
<td>910</td>
<td>Chinese IRABI/YDQ</td>
<td>Top 10% of scorers</td>
<td>5.9</td>
</tr>
<tr>
<td>China</td>
<td>Zhang, Amos, &amp; McDowell</td>
<td>2008</td>
<td>143</td>
<td>Same as Wang (2001)</td>
<td>≥4</td>
<td>14</td>
</tr>
<tr>
<td>China</td>
<td>Huang et al.</td>
<td>2009</td>
<td>3,496</td>
<td>YDQ</td>
<td>≥5</td>
<td>9.6</td>
</tr>
<tr>
<td>China</td>
<td>Ni, Yan, Chen, &amp; Liu</td>
<td>2009</td>
<td>3557</td>
<td>IAT</td>
<td>≥50</td>
<td>6.4</td>
</tr>
<tr>
<td>China</td>
<td>Li, Wang, &amp; Wang</td>
<td>2009</td>
<td>654</td>
<td>YDQ, GPIUS</td>
<td>≥5</td>
<td>13.6</td>
</tr>
<tr>
<td>China</td>
<td>Liu, Bao, &amp; Wang</td>
<td>2010</td>
<td>380</td>
<td>YDQ</td>
<td>≥4</td>
<td>16.2</td>
</tr>
<tr>
<td>Iran</td>
<td>Mazhari</td>
<td>2012</td>
<td>976</td>
<td>Problematic Internet Use Questionnaire^</td>
<td>≥41</td>
<td>21</td>
</tr>
</tbody>
</table>

^There are two questionnaires with this title. The version used in this study was created by Demetrovic, Szeredi, & Rozsa, 2008.
3.1.2.2. Africa. While Table 3.1 failed to include any studies from Africa, one study was located that focused on prevalence of Internet Addiction among African university students. This study used the IAT, and reported prevalence rates of 3.3% (Adiele & Olatokun, 2014). Obviously, further research in African samples is needed to confirm that these prevalence rates can be replicated; however, from these results alone, it seems that Internet Addiction occurs in similar frequency in African university students as it does in Australian university students.

3.1.2.3. North America. In the selection of studies presented in Table 3.2, prevalence rates in the USA range widely, from 1.2% (Fortson et al., 2007) to 13% (Scherer, 1997). Interestingly, both Fortson et al. and Scherer used DSM-IV criteria for substance-related disorders to measure Internet Addiction, but they both adhered to different cut-off methods. It is possible that Scherer’s cut-off of any three or more criteria is too lenient, as a prevalence rate of 13% is much higher than that reported in other studies based in the USA. On the other hand, the cut-off used by Fortson et al., which was to require responses in the upper limits of the scale for each relevant item, may have been too conservative. Of the other US studies, prevalence has ranged from 4% to 8.1%. As already stated, it is difficult to compare these studies with one another due to the diverse methods used to assess Internet Addiction. It is also difficult to compare the prevalence rates of US university and high school students, as there has not been enough research in the latter population.

3.1.2.4. Europe. Studies looking at the prevalence of Internet Addiction in European university students are limited when compared with those looking at high school students. One of the first was performed in the United Kingdom (UK) by Niemz et al. (2005). Using the pathological Internet use scale created by Morahan-Martin and Schumacher (2000), Niemz et al. reported that 18.3% of students were Internet addicted. This is much higher than the rate of 8.1% found by Morahan-Martin and Schumacher in their US sample using the same measure. This suggests that Internet Addiction may be more prevalent among British university students as compared with US students, but given that a more recent study using a different scale reported rates of 3.2% (Kuss et al., 2013) further comparative studies are necessary.

In a Greek study, Frangos et al. (2011) reported a prevalence rate of 12% using the YDQ. This is much higher than the rates recorded in the Greek studies of high school students (see Table 3.1), which also used the YDQ. However, it is
important to note that Frangos et al. used a more lenient cut-off score than researchers employing samples of high school students.

3.1.2.5. Asia. In terms of prevalence studies among samples of Asian university students, the prevalence rates range between 5.94% (Chao & Hsiao, 2000) and 21% (Mazhari, 2012). However, it is important to note that out of the seven studies in Table 3.2, six different methods of assessment were used. It does appear that the prevalence of Internet Addiction amongst Taiwanese university students is lower than among high school students. In contrast, there appears to be much higher incidence of Internet Addiction among Chinese university students when compared to high school students. Unfortunately, these trends are difficult to prove given the limited number of studies discussed here, and the fact that there is no consistency between measures and cut-off scores used across these studies. However, this is a potentially interesting trend, which could be the focus of further research.

3.1.3. General population. Table 3.3 provides the details of studies measuring the prevalence of Internet Addiction in the general population. As only nine studies meeting this criterion were located, it appears as if there has been limited research in this area. Interestingly, most of these studies were performed in the formative years of Internet Addiction research, and recruitment occurred online (e.g., Egger & Rauterberg, 1996; Greenfield, 1999; Young, 1996). Most of these scholars tended to target participants who may have already considered themselves to be Internet addicted and, as a result, these studies have been criticised for obtaining biased samples (Huisman et al., 2001; Nichols & Nicki, 2004). This is especially so in Young’s study, as she reported an unusually high prevalence rate of 80%.

In more recent studies of Internet Addiction in the general population, prevalence rates have ranged from 1% in Norway (Bakken et al., 2009) to 63.4% in the UK (Quiñones-Garcia & Korak-Kakabadse, 2014). In terms of the Norwegian study, this is not dissimilar to the results found in high school students by Johannson and Götestam (2004). On the other hand, the results from the UK study indicate a much higher prevalence rate than that found in previous studies of high school or university students from that country (see Tables 3.1 and 3.2). Unfortunately, given the dearth of recent studies located, further discussion about these results is difficult.

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8 Due to the limited number of studies, an analysis by location has not been performed.
Table 3.3

*Prevalence of Internet Addiction in General Population*

<table>
<thead>
<tr>
<th>Location</th>
<th>Author(s)</th>
<th>Year</th>
<th>Sample Size</th>
<th>Method of Assessment</th>
<th>Diagnostic Cut-off</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Africa</td>
<td>Thatcher, Wrestschko, &amp; Fisher</td>
<td>2008</td>
<td>1399</td>
<td>PIUQ</td>
<td>Not stated</td>
<td>2.6</td>
</tr>
<tr>
<td>Europe</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Norway</td>
<td>Bakken, Wenzel, Gotestam, Johansson, &amp; Oren</td>
<td>2009</td>
<td>3,399</td>
<td>YDQ</td>
<td>≥5</td>
<td>1</td>
</tr>
<tr>
<td>UK</td>
<td>Quiñones-Garcia &amp; Korak-Kakabadse</td>
<td>2014</td>
<td>516</td>
<td>CIUS</td>
<td>&gt;32</td>
<td>63.4</td>
</tr>
<tr>
<td>Asia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Korea</td>
<td>Whang, Lee, &amp; Chang</td>
<td>2003</td>
<td>14,111</td>
<td>IAT (Korean)</td>
<td>≥60</td>
<td>3.5</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>Chak &amp; Leung</td>
<td>2004</td>
<td>722</td>
<td>YDQ</td>
<td>≥5</td>
<td>14.7</td>
</tr>
<tr>
<td>Iran</td>
<td>Kheirkhah, Juibary, Gouran, &amp; Hashemi</td>
<td>2008</td>
<td>1856</td>
<td>YDQ</td>
<td>≥5</td>
<td>22.8</td>
</tr>
<tr>
<td>Worldwide</td>
<td>Egger &amp; Rauterberg</td>
<td>1996</td>
<td>454</td>
<td>Single self-diagnostic question</td>
<td>Answers ‘Yes’</td>
<td>10.6</td>
</tr>
<tr>
<td></td>
<td>Young</td>
<td>1996</td>
<td>496</td>
<td>YDQ</td>
<td>≥5</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>Greenfield</td>
<td>1999</td>
<td>17,251</td>
<td>Based on DSM-IV criteria for pathological gambling</td>
<td>≥5</td>
<td>6</td>
</tr>
</tbody>
</table>
3.1.4. Concluding remarks. As this section has shown, many studies over the last 18 years have examined the prevalence of Internet Addiction. If all the prevalence rates presented in this chapter are compared, it is clear that East Asian countries (particularly Taiwan) generally report the highest incidence of Internet Addiction. Asian scholars have presented various plausible explanations for this trend. First, in South Korea and Taiwan, advanced Internet infrastructure has been in place since early in the 21st century. This led to the early and enthusiastic adoption of online technology, particularly among young people (Ha et al., 2007). Secondly, in countries such as China, there tends to be a culture of fierce academic competition amongst students and high parental expectations (Chen & Lan, 1998). Some scholars have theorised that the stress that this situation creates leads students to escape to a virtual world for relief (Zhong et al., 2011). Finally, as Yen et al. (2010) point out, there is a much stronger subculture of online gaming in Asia in comparison with Western countries. In Taiwan in particular, Internet gaming cafes are often located near schools in order to attract student customers (Wu & Cheng, 2007).

Another pattern to emerge in this discussion of the prevalence of Internet Addiction is the type of populations that have been examined. The majority of studies have focused on samples of high school or university students. The rationale for this appears to be based on the ease with which students have been able to access the Internet on school and university campuses (Nalwa & Anand, 2003), and the fact that Internet use for academic pursuits has generally been encouraged in student populations (Pawlak, 2002; Young & Abreu, 2011). Researchers have also pointed to the vulnerability of adolescents to develop various forms of addiction (Kaltiala-Heino et al., 2004), and the opportunities that university students have to engage in unstructured and unsupervised computer use (Jenaro et al., 2007). The high incidence of Internet usage amongst young adults is also a salient factor (Durkee et al., 2012; Huang et al., 2009; Tsai & Lin, 2001).

Given the continuing encouragement of technology use in educational settings, it is likely that researchers will continue to study Internet Addiction in student samples. However, it is also important that researchers do not neglect other populations; published case studies have indicated that stay-at-home parents and unemployed people may also be at risk of developing Internet Addiction (Young, 1998), and these populations appear to be under-represented in prevalence studies. Furthermore, the studies represented in this discussion did not reveal a sharp contrast between prevalence of Internet Addiction across the three populations,
which suggests that there may not be a strong need for researchers to focus so heavily on student samples.

It is worth mentioning that no research was found from countries such as Japan, Brazil, Russia, Germany, and Indonesia. Given the penetration of Internet use in these countries (Internet World Stats, 2014), this absence is disappointing. However, it may simply reflect a lack of English-language research in these countries. In addition, prevalence studies from other English-speaking Western countries, such as Canada, New Zealand, and South Africa, were also lacking. Clearly, further research is needed to examine the incidence of Internet Addiction worldwide.

On a final note, there are several limitations apparent in the prevalence literature. First, researchers have often failed to take into account the type of Internet activities practiced by addicts when measuring prevalence. Second, due to the large number of available Internet addiction instruments, there is a degree of heterogeneity in regard to the conceptualisation of this disorder. Third, the samples that are used in these studies are often selected for convenience, rendering them less than representative. Finally, given the methodological inconsistency seen in research thus far, it would be beneficial if this research progressed using a single gold-standard measure of Internet Addiction, which adhered to a consistent cut-off point.

3.2. Factors associated with Internet Addiction

In addition to total prevalence rates of Internet Addiction, some of the studies discussed above also reported separate prevalence rates for men and women. This data is presented in Table 3.4. As can be seen, there is a strong trend for prevalence rates to be higher among men than women. In fact, even though some studies reported rates that were quite similar (e.g., Kaltiala-Heino et al., 2004; Ni et al., 2009) in no case was the incidence of Internet Addiction in women higher than it was in men. Men generally have a higher prevalence of Internet Addiction than women, regardless of age, culture, method of assessment, or year of study. In some studies, this gender difference has been found to be significant (e.g., Ha et al., 2007; Huang et al., 2009; Johansson & Götestam, 2004; Neimz et al., 2005; Shi, Chen, & Tien, 2011; Wang, 2001).

In addition to the finding that gender was a significant predictor, Shi et al. (2011) and Huang et al. (2009) also reported on several other variables found to predict Internet Addiction. In a sample of 979 random adult passers-by, Shi et al.
found that self-efficacy with Internet use and sensation seeking were positive predictors of Internet Addiction. Huang et al., who focused on Chinese university students, reported that poor academic achievement, poor family atmosphere, and lack of love from parents were all significant predictors of Internet Addiction. These authors also reported that high frequency of Internet use was a positive predictor. The finding regarding high levels of Internet use was also supported by findings from an Australian study (Mottram & Fleming, 2009).

Table 3.4

Internet Addiction Prevalence Rates in Men and Women

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Year</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morahan-Martin &amp; Schumacher</td>
<td>2000</td>
<td>12.2</td>
<td>3.2</td>
</tr>
<tr>
<td>Wang</td>
<td>2001</td>
<td>6.1</td>
<td>3</td>
</tr>
<tr>
<td>DiNicola</td>
<td>2003</td>
<td>9.7</td>
<td>5.8</td>
</tr>
<tr>
<td>Kaltiala-Heino et al.</td>
<td>2004</td>
<td>1.7</td>
<td>1.4</td>
</tr>
<tr>
<td>Johansson &amp; Götestam</td>
<td>2004</td>
<td>2.4</td>
<td>1.5</td>
</tr>
<tr>
<td>Niemz et al.</td>
<td>2005</td>
<td>28.7</td>
<td>9.5</td>
</tr>
<tr>
<td>Ko et al.</td>
<td>2006</td>
<td>26.4</td>
<td>11.1</td>
</tr>
<tr>
<td>Kim et al.</td>
<td>2006</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>Cao &amp; Su</td>
<td>2007</td>
<td>4</td>
<td>0.8</td>
</tr>
<tr>
<td>Ha et al.</td>
<td>2007</td>
<td>35.5</td>
<td>24.3</td>
</tr>
<tr>
<td>Yen et al.</td>
<td>2007</td>
<td>20.1</td>
<td>10.6</td>
</tr>
<tr>
<td>Siomos et al.</td>
<td>2008</td>
<td>4.4</td>
<td>1.5</td>
</tr>
<tr>
<td>Jang et al.</td>
<td>2008</td>
<td>6.8</td>
<td>3.5</td>
</tr>
<tr>
<td>Huang et al.</td>
<td>2009</td>
<td>13.5</td>
<td>4.9</td>
</tr>
<tr>
<td>Ni et al.</td>
<td>2009</td>
<td>6.6</td>
<td>6.1</td>
</tr>
<tr>
<td>Liu et al.</td>
<td>2009</td>
<td>20.6</td>
<td>11.6</td>
</tr>
<tr>
<td>Bakken et al.</td>
<td>2009</td>
<td>7.4</td>
<td>3.1</td>
</tr>
<tr>
<td>Fu et al.</td>
<td>2010</td>
<td>8.4</td>
<td>4.5</td>
</tr>
<tr>
<td>Fisoun et al. (YDQ)</td>
<td>2011</td>
<td>13.8</td>
<td>8</td>
</tr>
<tr>
<td>Fisoun et al. (IAT)</td>
<td>2011</td>
<td>7.2</td>
<td>5.1</td>
</tr>
<tr>
<td>Villella et al.</td>
<td>2011</td>
<td>1.3</td>
<td>1.0</td>
</tr>
<tr>
<td>Durkee et al.</td>
<td>2012</td>
<td>5.2</td>
<td>3.8</td>
</tr>
<tr>
<td>Şaşmaz et al.</td>
<td>2013</td>
<td>20.4</td>
<td>9.3</td>
</tr>
<tr>
<td>Tang et al.</td>
<td>2014</td>
<td>7.5</td>
<td>2.8</td>
</tr>
<tr>
<td>Adiele &amp; Olatokun</td>
<td>2014</td>
<td>5</td>
<td>1.7</td>
</tr>
</tbody>
</table>
In a recent Chinese study, Yao, Han, Zeng and Guo (2013) examined the relationship between mental health and Internet Addiction in a sample of 977 male freshman university students. Using a retrospective nested case-control design, Yao et al. measured mental health in the first year of university using the Chinese College Students Mental Health Scale. In the three years that followed, they used the YDQ to identify which members of the cohort developed Internet Addiction \((n = 64)\). Matched controls were assigned to the Internet addicted group. The following variables were found to be causal factors and predictors for the later development of Internet Addiction: somatisation, anxiety, depression, and self-contempt. Although this study looked at a specific population and culture, it does demonstrate that the existence of mental health issues may be a risk factor for the development of Internet Addiction. In addition, the results from the study by Huang et al. (2009) suggest that a negative family atmosphere may also contribute.

### 3.2.1. Social aspects.

Throughout 17 years of Internet Addiction research, scholars have repeatedly identified a link between Internet Addiction and using the Internet for socially interactive purposes. In fact, in the very first study of Internet Addiction, Young (1996; discussed in Section 2.3.2) reported that 63% of Internet-addicted participants used real-time interactive communicative applications of the Internet, such as chat rooms and Multi-User Dungeons (MUDs)\(^9\). This trend was not evident among non-dependents, as they mainly used the Internet for gathering information (49%) and email (30%). In response to Young’s findings, Beard and Wolf (2001) opined:

> A person can use applications such as Multi-User Dungeons or go to areas online and engage in sexual fantasy. The person could also create a surrogate community by going into a chatroom and pretending to interact with others or objects in the fabricated cyber-environment. Young states that, once these unconscious feelings, drives, and experiences are brought to the conscious mind, it becomes difficult for some users to suppress them again. Internet users may begin to desire these unique aspects of the Internet more and more. As a result, Internet users may begin to blur their distinction between their own personality and reality, and their online persona and virtual environment. (p. 8)

Many researchers suggest that individuals who feel this way may be missing something in their offline lives. For instance, in their study, Morahan-Martin and

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\(^9\) MUDs are text-based multi-player role-playing games, which were popular in the 1990s.
Schumacher (2000) noted that Internet-addicted participants were more likely to be lonely in their offline lives. From this they argued “the Internet may provide an attractive alternative to a mundane or unhappy life for individuals who are emotionally isolated by real or imagined awkwardness and unattractiveness or who are socially alienated or excessively shy” (p. 26). Beard and Wolf (2001) supported this argument, suggesting that for Internet-addicted individuals, communicating over the Internet could be more satisfying than communicating via traditional offline methods. Chang and Law (2008) agreed, writing, “people engaged in cyber-relationships are more likely to view the Internet as another reality and use their computer-mediated relationships to replace social interactions in the real world” (p. 2609).

Qualitative data collected by Young (1996) in her original study supports these ideas, as the results suggested that Internet dependents enjoyed using the Internet to form new relationships, and that these relationships were considered to be private, highly intimate, and important. Many dependent respondents also admitted that they preferred these relationships to offline relationships, as they found anonymous communication to be easier. They also stated that they had a higher degree of control about the personal information they divulged when communicating to people online, and that this was a positive factor of their Internet use. Morahan-Martin and Schumacher (2000) also remarked on similar trends in their study. They stated that Internet-addicted users were more likely than non-addicted users to use the Internet for relationship formation, emotional support, communicating with like-minded people, and playing interactive games such as MUDs. Addicted individuals also were more open on the Internet and more able to be themselves, which resulted in enhanced levels of social confidence. They were also more inclined to share intimate details about themselves and find the anonymity of Internet communication to be disinhibiting.

Several studies have provided statistical evidence to support the above claims. For instance, Chak and Leung (2004) surveyed 343 undergraduate students from Hong Kong and found that shyness was a positive predictor of Internet Addiction. Similarly, a recent study by Bozoglan et al. (2013) tested a predictive model of Internet Addiction using three variables: loneliness, self-esteem, and life satisfaction. While this model explained 38% of the variance, loneliness was the strongest individual predictor of Internet Addiction. Similarly, Caplan (2002; 2003; 2005; 2007) has completed several studies examining the role of Internet Addiction and socially based variables, such as loneliness and preference for social interaction.
Caplan’s significant contribution will be discussed in more detail in Section 3.4.

### 3.3. Forms of Internet Addiction

Throughout Chapters 2 and 3, Internet Addiction research has been discussed in detail. Up until this point, however, there has been little mention made of the fact that Internet Addiction may involve different forms. The first sense that this might be the case appeared in the previous section relating to predictors of Internet Addiction (Section 3.2). During that discussion, it emerged that Internet Addiction appeared to be strongly tied to social and interactive uses of the Internet. Acknowledging this trend, some researchers began to differentiate between different forms of Internet use (i.e., Pratarelli, Browne, & Johnson, 1999) and addiction (i.e., Davis, 2001; Young et al., 1999). For instance, Young et al. (1999) surveyed 35 therapists online regarding their experiences in treating patients with Internet Addiction. Based on their qualitative responses, the authors identified five specific classifications of Internet Addiction:

1. Cybersexual Addiction: compulsive use of adult web sites for cybersex and cyberporn
2. Cyber-relationship Addiction: over-involvement in online relationships
3. Net Compulsions: obsessive online gambling, shopping, or online trading
4. Information Overload: compulsive web surfing or database searches
5. Computer Addiction: obsessive computer game playing

In response to these five classifications, Griffiths (2000b) has argued that “many of these excessive users are not ‘Internet addicts’ but just use the internet excessively as a medium to fuel other addictions. A gambling addict or a computer game addict is not addicted to the Internet. The Internet is just the place where s/he engages in the behaviour” (p. 428). Sim, Gentile, Bricolo, Serpelloni, and Gulumoydeen (2012) also address this idea, stating, “these issues are not the same as pathological Internet use… as the underlying disorder is about sex or gambling and the Internet is simply the delivery mechanism used. Treating a pathological gambler’s computer use is unlikely to resolve the underlying problem” (p. 749). Griffiths goes on to argue that Internet Addiction should refer to behaviour that could not occur without using the Internet, for instance, online chat rooms and MUDs.

In 2001, Davis introduced terminology that could be used to differentiate between the two types addiction discussed by Griffiths (2000b). Specific Pathological
Internet Use\textsuperscript{10} refers to content-specific addictive use of the Internet. It is expected that this sort of addictive behaviour would continue in the absence of the Internet, and is focused on a single application. For instance, addiction to online gambling, shopping, and cybersex would all be instances of Specific Pathological Internet Use. On the other hand, Davis (2001) described the concept of multidimensional addiction to the Internet, which he termed Generalised Pathological Internet Use. He posited that this type of Internet Addiction is predominantly associated with social uses of the Internet, such as chat rooms and email. Much like Griffiths, Davis remarked that this type of Internet Addiction was motivated by a strong need for social connectedness, which was reinforced by going online. He also argued that procrastination is an important factor in the development of Generalised Pathological Internet Use, and stated that the continuation of such behaviour leads to increased stress and negative life consequences.

In spite of the arguments put forward by Griffiths (2000b) and Davis (2001), the majority of empirical studies do not distinguish between different types of Internet Addiction. This is certainly the case for most of the prevalence studies presented in Section 3.1. This is problematic, as it is possible that a cybersex addict experiences different kinds of symptoms and predisposing factors to an obsessive online gambler. Moreover, it is likely that both of those individuals are motivated by different factors than a person who is addicted to virtual worlds or online chat. In the offline world, pathological gamblers and sex addicts would most certainly be assessed using separate measures that had been based on theory relevant to those particular activities. There is a case to be argued that this should also occur in the virtual world. Put simply, why should these addictions be conceptualised any differently just because they occur online?

Furthermore, the Internet has changed considerably since Young et al. (1999) first asked therapists about the most common classifications of Internet Addiction. For instance, if Young’s study were conducted in 2014, it is possible that there would be additional classifications relating to addiction to social networking sites, 3D virtual worlds (such as Second Life), and MMORPGs (such as World of Warcraft). It is important that research continues to define different types of addictive behaviors on the Internet, as different types of addiction are likely to be motivated by different gratifications. The need to continue such work is one of the foundations of this thesis.

\textsuperscript{10}Davis (2001) did not advocate the use of the term ‘addiction’ as it was not included in the DSM. In this thesis, the terms ‘problematic Internet use’ and ‘addiction’ are used interchangeably.
3.4. Aetiology of Internet Addiction

In all of the research studies discussed thus far, Internet Addiction was either conceptualised as being similar to an existing form of mental disorder from the *DSM-IV* (APA, 2000), generally Pathological Gambling or Substance Dependence, or was considered to take selected elements from a combination of disorders. There was often very little discussion about why these borrowed models were appropriate (i.e., Young, 1996), and once the symptoms had been confirmed in a single sample, that was evidence enough to justify their continued use. Due to the popularity of this approach, few researchers have attempted to theorise any further about how and why Internet Addiction actually occurred. However, there are a few exceptions to this rule. This section will introduce the theoretical discussions of two significant scholars in this area: Davis (2001) and Caplan (2002; 2003; 2005; 2007). In doing so, the link between online social interaction and the development of Internet Addiction will become clearer.

3.4.1. Davis’ cognitive behavioural model. The first researcher to present a theoretical model of the development of Internet Addiction was Davis (2001). Davis’ model, known as the *cognitive-behavioural model of Pathological Internet Use*, posits that Internet Addiction is caused by negative cognitions, which then lead to the development of behavioural symptoms. This occurs within a diathesis-stress model of behaviour whereby the existence of underlying psychopathology, such as depression or Substance Dependence, is the diathesis and the introduction of the Internet is the stressor. Davis (2001) explains that, for Internet Addiction to occur, an individual with existing psychopathology must feel a positive response when using a certain function of the Internet. This positive response has a reinforcing effect, which then conditions the individuals to repeatedly perform the same behaviour. Conditioning can be further reinforced by other situational stimuli, such as the feel of the keyboard or the smell of the office in which the individual usually uses the Internet.

To explain this model, Davis (2001) introduces the concept of *necessary* and *sufficient causes*, which can be used to explain the aetiology of disorders. A necessary cause must be present for the development of symptoms to occur; however the presence of the factor does not guarantee that symptoms will occur. On the other hand, a sufficient cause does guarantee that the symptoms associated with the disorder will occur. In terms of Internet Addiction, Davis argues that both the existence of the stressor (Internet use) and the diathesis (psychopathology) are
necessary causes, and the existence of maladaptive cognitions is a sufficient cause.

When discussing maladaptive cognitions, Davis (2001) makes the distinction between two types of thoughts: those relating to the self, and those relating to the world. Thoughts about the self are associated with constant rumination about the individual’s own Internet Addiction, negative self-appraisal, and self-doubt. According to Davis, self-related cognitions include such thoughts as, “I am only good on the Internet”, “I am worthless offline, but online I am someone”, and “I am a failure when I am offline”. On the other hand, thoughts about the world are more externally focused, with examples such as “The Internet is the only place I am respected”, “Nobody loves me offline”, and “The Internet is my only friend”. In Davis’ model, these thoughts are automatically triggered in at-risk individuals when they begin using the Internet, which then leads to the development of either Specific or Generalised Pathological Internet Use.

As seen in Figure 3.1, Davis’ (2001) model provides plausible pathways for the development of either Specific or Generalised Problematic Internet Use. It is based on well-accepted psychological theories, such as the diathesis-stress model and operant conditioning. Due to its cognitive-behavioural focus, this model implies that cognitive-behavioural therapy may be an appropriate form of treatment. According to Caplan (2002), Davis’ model “offers a clear conceptualisation of PIU, as a construct, that lends itself to empirical operationalization” (p. 556). However, in order to be a useful model, empirical evidence is needed to support its application.

![Figure 3.1. Davis’ cognitive behavioural model of Problematic Internet Use. Adapted from “A cognitive-behavioral model of pathological Internet use,” by R. A. Davis, 2001, Computers in Human Behavior, 17, p. 190. Copyright 2001 by Elsevier.](image-url)
3.4.1.1. The Online Cognition Scale (OCS). The OCS (Davis et al., 2002) was the first of two measures to be created based on the model proposed by Davis (2001). It is a 36-item multidimensional measure that, according to confirmatory factor analysis, provides a global score of Internet Addiction. It also taps into four sub-scales: loneliness/depression, diminished impulse control, social comfort, and distraction. Further details about the development and psychometric properties of the OCS are provided in Chapter 6.

In regards to the content validity of the OCS, Davis et al. (2002) explain that the diminished impulse control sub-scale is associated with the presence of severe Internet Addiction, as the items within this sub-scale were endorsed infrequently. The items in this subscale relate to obsessive Internet-related thoughts and the inability to cut down or stop Internet use. In Davis’ model (2001), these behaviours are outcomes of the operant conditioning that occurs when the Internet is found to soothe the maladaptive cognitions of the individual. On the other hand, the loneliness/depression sub-scale, which taps into depressive thoughts and feelings of worthlessness, is represented in Davis’ model as a preceding factor of Internet Addiction. The social comfort sub-scale, which relates the use of the Internet to increase feelings of social connectedness, is another preceding factor in the model, and was found by Davis et al. to be associated with loneliness\(^\text{11}\) and feelings of rejection. The final sub-scale, distraction, refers to using the Internet to procrastinate from other tasks or responsibilities. In his 2001 paper, Davis explains that procrastination is involved in both the development and maintenance of Internet Addiction. It appears then that the OCS provides some support for Davis’ cognitive-behavioural model of Problematic Internet Use. However, it is unclear whether this scale can distinguish between Specific and Generalised Problematic Internet Use. Furthermore, the findings presented here do not seem to have been replicated in other studies.

3.4.1.2. The Generalised Problematic Internet Use Scale (GPIUS). The second measure to be inspired by Davis’ (2001) model was the GPIUS (Caplan, 2002), which, as the name suggests, measures Generalised Problematic Internet Use. Following an exploratory factor analysis, the 29-item GPIUS was found to produce a total score, as well as scores on seven sub-scales: Mood Alteration, Perceived Social Benefits, Negative Outcomes, Compulsivity, Excessive Time, Withdrawal, and Interpersonal Control. Further information about the GPIUS is also

\(^{11}\) As measured by the UCLA Loneliness Scale.
provided in Chapter 6.

After conducting a factor analysis of the GPIUS, Caplan (2002) concluded that the seven factors could all be encompassed broadly within the conceptual model proposed by Davis (2001). For instance, he suggests that the factors of social control, social benefits, and withdrawal fit within the cognitive elements of the model, while compulsivity, mood alteration and excessive use fit within the behavioural symptoms. In regards to negative outcomes, this describes the consequences of the Internet Addiction; however this explanation is not completely consistent with Davis’ approach. Caplan posits that “a greater level of detail...might be included in future development of the generalised PIU construct” (p. 567).

In terms of supporting Davis’ (2001) original model, the GPIUS factors of perceived social benefit and perceived social control are perhaps the most relevant, particularly to the area of Generalised Problematic Internet Use. Furthermore, much like the social comfort factor from the OCS, these two factors are not represented in any of the existing diagnostic criteria of Internet Addiction. Caplan (2002) describes social benefit as encompassing an “individual’s preference for engaging in social behaviour online, rather than face-to-face” (p. 568), while social control involves “an individual’s preference for the increased degree of social control available online, as compared to face-to-face communication” (p. 568). Caplan concludes that these factors should be explored in more detail by Internet Addiction researchers, as they may explain the association between negative outcomes and a preference for using the Internet to engage in social communication.

3.4.2. Caplan’s social skill model. Following the creation and factor analysis of the GPIUS, Caplan (2003) narrowed in on Davis’ (2001) model to focus on factors that may predispose an individual to developing Generalised Problematic Internet Use. In doing so, Caplan theorised that individuals who are lonely or depressed perceive their social competence in negative terms. As a result, when they are introduced to the Internet, they may develop a preference for online social interaction. This occurs because they feel they can be more outgoing and socially efficacious online. However, the existence of this preference for online social interaction can lead to excessive and compulsive Internet use in some users. This may then interfere with their offline relationships and responsibilities, which can cause negative outcomes in their lives. It may also reinforce the idea that their social competence in offline scenarios is lacking.

To test this model of Generalised Problematic Internet Use, Caplan (2003)
recruited 386 American undergraduate students (270 women and 116 men) aged between 18 and 57 years old. In order to measure preference of online social interaction, Caplan used the perceived social benefit and perceived social control sub-scales of the GPIUS, and combined their scores to create a new measure. He also added additional items to increase the face validity of the measure. This scale had a good level of internal consistency (0.86). In addition to preference for online social interaction, Caplan measured Internet Addiction and negative outcomes using the GPIUS, while psychosocial wellbeing was measured using the *Beck Depression Inventory II* and the *UCLA Loneliness Scale*.

The results of this exploratory study (Caplan, 2003) revealed that there was a significant positive relationship between the measures of psychosocial wellbeing (depression and loneliness) and preference for online social interaction. This association explained 19% of the variance in psychosocial wellbeing scores. Caplan suggested that variables such as perceived social skill, self-monitoring, extraversion, and communication apprehension may explain more of the variance in this model. The results also confirmed the hypothesis that having a preference for online social interaction predicted the variance in levels of Internet Addiction, and negative outcomes associated with Internet use. In a multivariate test (MANOVA), preference for online social interaction explained 41% of the variance of the aforementioned variables. Caplan interpreted this result by stating that individuals who prefer online social interaction to face-to-face interaction are predisposed to develop Internet Addiction. However given the exploratory nature of the study, further research is needed to confirm this finding.

In the discussion of his results, Caplan (2003) singled out an unexpected outcome of the study: loneliness was found to be a more significant factor in the development of Internet Addiction than depression. Caplan explained that this result likely reflected a higher incidence of negative perception of levels of social competence among lonely people when compared with depressed people. However, in later years, Caplan (2007) hypothesised that the association between loneliness and preference for online social interaction was actually misleading. This is because individuals can be lonely for all sorts of reasons, and he felt that it was incorrect to assume that this always occurs due to a lack of social efficacy in offline interactions. In testing this alternative hypothesis, Caplan (2007) revealed that the association between loneliness and preference for online social interaction actually disappeared when social anxiety was added to the model. Therefore, social anxiety was
confounding the relationship between loneliness and preference for online social interaction.

In a more recent study, Caplan (2010) adjusted his model again to reflect research highlighting the importance of deficient self-regulation and mood regulation in the development of Generalised Problematic Internet Use (i.e., LaRose, Lin, & Eastin, 2003). In this context, deficient self-regulation refers to the behaviour of using the Internet compulsively and being preoccupied with use. Mood regulation involves using the Internet as a tool to escape from negative affective states, such as sadness and loneliness. In a study of 785 individuals (543 men and 242 women) aged between 18 and 70, Caplan used an updated version of the GPIUS, known as the GPIUS2, to measure Internet Addiction and its various factors. Although it was still in its exploratory stages, the GPIUS2 was found to have five sub-scales measuring preference for online social interaction, mood regulation, cognitive preoccupation, compulsive Internet use, and negative outcomes. The internal consistency of these sub-scales ranged from 0.82 – 0.87. Further information about the GPIUS2 is presented in Chapter 6.

The results of Caplan’s (2010) study, which employed structural equation modelling (SEM), supported the hypotheses that he put forward. Preference for online interaction was established as a positive predictor of mood regulation and deficient self-regulation of Internet use. Further, mood regulation predicted deficient self-regulation, which then predicted negative outcomes of Internet use. Caplan also reported on several indirect-effects of certain variables. For instance, mood regulation mediated the relationship between preference for online social interaction and deficient self-regulation, and deficient self-regulation mediated the relationship between preference for online social interaction and negative outcomes of Internet use. The final indirect-effect was found between mood regulation and negative outcomes, with deficient self-regulation acting as a mediator. Caplan’s model is presented in Figure 3.2.
3.5. Summary

The conceptual chaos that exists within Internet Addiction research makes a traditional literature review challenging. This was most salient during the discussion of prevalence, as many different measures of Internet Addiction have been used, which has resulted in widely varying prevalence rates. However, throughout this chapter, the intention has been to focus on the aspects of Internet Addiction that may be of most relevance to Facebook Addiction. In doing so, this chapter has highlighted the concept of Generalised Problematic Internet Use, which relates most strongly to addiction to social uses of the Internet. By discussing the work of Davis (2001) and Caplan (2002; 2003; 2005; 2007), attention has been brought to the lack of theoretical underpinnings in the majority of Internet Addiction research. Furthermore, this chapter presented research that suggests that having a preference for online social interaction is a strong predictor of the development of addiction to the Internet. This information is likely to be relevant to a study of Facebook Addiction. Having now given an overview of the state of Internet Addiction research, the next chapter presents a literature review of research relating to Facebook Addiction.
Chapter 4
Facebook Use and Abuse

In the last decade, the use of social networking sites (SNS) has grown exponentially. For example, as mentioned in Chapter 1, there are 1.32 billion active users on Facebook per month. Moreover, at least 829 million of these users log into Facebook every day (Facebook, 2014). With statistics such as these, it is not surprising that Facebook is the most popular SNS in the world (see Figure 4.1). As a result of this popularity, social scientists have recently begun to examine aspects of its use (for a detailed review of this topic see Wilson, Gosling, & Graham, 2012). However, limited research has examined the potential for Facebook use to become addictive (Griffiths et al., 2014).

Social Networking Site Addiction has been defined as a failure to regulate usage, which then leads to negative personal outcomes (LaRose, Kim, & Peng, 2010). In 2011, Kuss and Griffiths performed a comprehensive literature review to examine the legitimacy of SNS Addiction. In their paper, they focused on six key areas: usage patterns, motivations for SNS use, personalities of SNS users, negative consequences of SNS use, empirical evidence of SNS Addiction, and co-morbidity. At that time, the authors were only able to locate five studies of SNS Addiction, which limited their ability to ascertain the status of this potential disorder. While they were able to recognise that excessive use of SNSs can be linked to negative outcomes, they concluded that more extensive research was required to prove the existence of SNS Addiction.

Three years later, Griffiths et al. (2014) performed another review of SNS Addiction, this time locating 17 studies. This increase in the extant literature highlights the perceived salience of this topic of investigation. However, despite the larger body of research available for review, Griffiths et al. were not able to offer any more substantial conclusions. While they did find preliminary evidence for some symptoms of SNS Addiction (e.g., preoccupation, withdrawal, and negative consequences), methodological issues associated with the majority of studies precluded the ability to form any solid conclusions regarding the legitimacy of this condition. As a result, they proposed that the question of whether addiction to SNSs exists still remains open for debate.

Griffiths et al. (2014) also made the valid point that describing SNS Addiction is not a clear-cut process. In particular, they posit that becoming addicted to the social aspects of SNS use may represent “cyber-relationship addiction” (Young, 1999), while addiction to SNS games, such as the popular Facebook application Farmville, should fall under the classification of “gaming addiction” (Griffiths, 2012). In this thesis, it is argued that this notion should be taken one step further. Just as the Farmville addict may differ from someone who compulsively posts social content on SNSs, so too may the motivations of the Facebook addict differ from the Twitter addict. Therefore, researchers should focus on examining addiction to specific SNSs (i.e., Facebook Addiction and Twitter Addiction), rather than just SNS Addiction in general.

In order to support the above claim, the present chapter begins by discussing research that reveals the contrasting motivations associated with the use of different SNSs. Following this, a review of literature relating to Facebook use and abuse is
presented. This section includes a brief discussion about the history and features of Facebook, followed by an overview of the common patterns and variables associated with Facebook use, and the uses and gratifications of the site. Following this, the focus will move on to an examination of the extant literature relating to Facebook Addiction. The synthesis of literature provided in this chapter clarifies the findings related to Facebook Addiction and also addresses questions regarding the particular motivations of Facebook users, and whether these motivations are linked to the development of Facebook Addiction.

4.1. Uses and Gratifications of SNSs and SNS Addiction

Commonly, when researchers choose to examine the motivations associated with particular forms of media, they do so by employing a uses and gratifications approach. Uses and gratifications theory states that one of the keys to understanding the popularity of mass media lies in the identification of the factors underlying its use (Katz, Blumler, & Gurevitch, 1973). This approach originally stems from the discipline of communication, and posits that individuals choose to engage in media use in order to fulfill certain psychological needs. While these needs can vary depending on the individual, research adopting the uses and gratifications perspective sets out to identify common themes. According to LaRose, Mastro and Eastin (2001), “uses and gratifications researchers typically start with descriptions of common media uses, obtain ratings of the frequency or importance of those uses, and factor analyse the results to obtain gratification factors that are then correlated with media use” (p. 396). Sheldon (2008) reports that the most common uses and gratifications of traditional forms of media are “diversion (escape from problems, emotional release), personal relationships (social utility of information in conversations, substitute of the media for companionship), personal identity (value reinforcement, self-understanding), and information” (p. 68).

While uses and gratifications theory was originally proposed prior to the invention of the Internet (i.e., Katz et al., 1973), it has since been adopted by Internet researchers to examine various types of digital media use, such as YouTube (Hagerty, 2008), instant messaging (Chen, 2011), online message boards (Clavio, 2008) and e-books (DeFosse, 2012). According to Papacharissi and Mendelson (2011), it is commonly accepted that, “online media serve as functional alternatives to

12 It is of note that only limited research has been published in this area.
interpersonal and mediated communication, providing options or complements for aspects of an individual’s environment that are not as fulfilling” (p. 214).

As the uses and gratifications perspective is employed to make sense of why people use particular forms of online media, it is not surprising that some researchers have extended this framework to investigate the development of Internet Addiction. For instance, Song, LaRose, Eastin and Lin (2004) argue that some Internet users can lose control over use that was originally motivated by “active consideration of the gratifications of online behaviour” (p. 390). They found that virtual community, monetary compensation, diversion, and personal status accounted for 28% of the variance in Internet Addiction scores in a sample of 498 US university students.

Researchers have also set out to discover the uses and gratifications of SNSs. One of the first studies in this area was performed by Raacke and Bonds-Raacke (2008). After surveying a sample of university students from the USA, these authors reported that the primary motivations for Facebook and MySpace use was to form and maintain social connections. Since that time, numerous studies have reinforced the importance of relationship maintenance as a key reason for Facebook use (e.g., Joinson, 2008; Sheldon 2008; 2009; Valentine, 2012). Indeed, Kuss and Griffiths (2011) argue that relationship maintenance is the main motivator for all SNS use.

However, studies looking at the uses and gratifications of SNSs other than Facebook tend to indicate that Kuss and Griffiths’ (2011) argument may be somewhat misleading. For example, Dunne, Lawlor, and Rowley (2010) report that one of the most important uses and gratifications for Bebo use among teenage girls is impression management. In addition, research relating to video and image sharing SNSs (such as YouTube and Pinterest) indicate that the use of these sites is primarily influenced by the need for self-expression and entertainment (Gülnar, Balci, & Çakir, 2010; Mull & Lee, 2014). Given the varied features of different SNSs, these findings are hardly surprising. As Chen (2011) notes, “multiple media compete for users’ attention,” and “active users select the medium that meets their needs” (p. 759).

The results of the studies above show that, while it is true that all SNSs serve a similar purpose - to facilitate social interaction through the efficient dissemination of information to a desired audience - the specific features of each individual site are often varied (boyd & Ellison, 2008). For this reason, it is unwise to assume that the results of a study that focuses on one particular SNS can be generalised to every SNS that is currently in existence (Panek, Nardis, & Konrath, 2013). Furthermore,
important differences in SNS usage might be undetectable when data from different sites are combined (Hargittai, 2008). Therefore, in the case of literature reviews such as those performed by Kuss and Griffiths (2011), it seems that the assumption of SNS homogeneity might be misguided. On the contrary, this thesis argues that the need to separate out results from specific sites is crucial to understanding the development of SNS Addiction.

In the introduction of this chapter, the point was made that the gratifications of a Facebook addict may differ from those of a Twitter addict. This example highlights the need for SNS Addiction researchers to consider the motivations behind the use of addictive SNS platforms. According to Papacharissi and Mendelson (2011), “online media serve as functional alternatives to interpersonal and mediated communication, providing options or complements for aspects of an individual’s environment that are not as fulfilling” (p. 214). In certain circumstances, Internet users may lose control over use that was originally motivated by “active consideration of the gratifications of online behaviour” (Song et al., 2004, p. 390).

While the relationships between uses and gratifications and SNS Addiction was previously recognised by Kuss and Griffiths (2011), limited research has been performed in this area. One of the first empirical studies to examine the relationship between SNS Addiction and uses and gratifications was performed by Wan (2009). She studied use of the campus-based SNS Xiaonei.com amongst a sample of 335 Chinese college students. The results revealed that Xiaonei.com addiction was significantly associated with the motives of socialisation and relationship building. Similarly, another study based on a Greek sample of 1971 adolescents (Floros & Siomos, 2013), found that the motivations of seeking friendship, relationship maintenance, and escapism, along with impulsive use of the Internet, predicted more frequent SNS participation.

While the two studies mentioned above support the notion that SNS use can be associated with a desire to socialise and form relationships online, findings from other studies indicate that this is not always the case. For example, Huang (2012) examined SNS use among 1549 adolescents, and found that entertainment gratifications were the strongest predictor of SNS Addiction. In another study, Chen and Kim (2013) revealed that there was a positive relationship between SNS Addiction and using SNSs for diversion and self-presentation. Of course, given that all of these studies (with the exclusion of Wan, 2009) measured aggregated SNS use, it is possible that these contrasting results reflect different types of SNSs used
by each sample. If so, this would contribute to the argument that SNS Addiction researchers should focus on specific sites, rather than SNS use in general.

This thesis focuses exclusively on Facebook Addiction. The selection of Facebook over other SNSs was made primarily because Facebook is considerably more popular than other SNSs (see Figure 4.1). Due to this popularity, it is possible that there may be unique factors associated with Facebook that are gratifying for a large number of Internet users. In addition, by studying a single SNS, the resulting data can be analysed in a more consistent way. As highlighted above, not all SNS have similar features, therefore focusing on one SNS in particular will reduce the chance of bias. The focus of this chapter now turns to a review of academic literature associated with Facebook use and abuse.

4.2. A Brief History of Facebook

Launched on February 4, 2004 (Facebook, 2014), Facebook\textsuperscript{13} was initially designed as an SNS for Harvard University students (Ellison et al., 2007). However, within a year the popularity of the site had grown to such an extent that students from other universities (and eventually high schools) within the USA requested to join (Zywica & Danowski, 2008). The creators of Facebook eventually allowed this, but they retained the exclusivity of the site by implementing a Network feature. This feature required that potential Facebook members could only join if their school had an existing network on the site. They also needed to sign up using an official email address from their school. If an official email address could not be provided, membership in the network had to be approved by an administrator (Facebook, 2014).

Prior to the creation of Facebook, several other SNSs (such as MySpace and Friendster) were popular amongst Internet users. However, none had based their membership around large pre-existing organisations or institutions in the same way as Facebook. This provided Facebook with a distinct point of difference (boyd & Ellison, 2008), and may have led to the rapid increase in membership of the site. With the site structured around existing offline networks, Facebook users were effectively part of an exclusive virtual social club. Within this club they could easily locate and interact with other users from within their offline social networks, such as current or former school friends. They could share content about themselves.

\textsuperscript{13} The site was originally called ‘Thefacebook’, but was renamed ‘Facebook’ in 2005 (Facebook, 2014).
amongst the people within their existing networks, and feel confident that this content was not viewable by people outside of these networks.

As the popularity of Facebook rapidly began to grow, continual changes were made to the network structure in order to allow more people to join. By October 2005, university students outside of North America were given access, while employees of large corporations were able to join by May 2006 (Facebook, 2014). By 26 September 2006 - just two and a half years after it was created - Facebook membership was opened up to anyone over the age of 13. Despite the influx of members over this period, the Network structure was retained and users were required to join either a closed network (such as an organisation or institution) or an open network (such as a city, country or region). By 2009, however, privacy concerns associated with sharing content on large open networks meant that the Network feature was no longer viable. At this point, it was removed in favour of a user-controlled privacy model (Zuckerberg, 2 December, 2009). This change saw Facebook move away from its initial organisation of segregated and exclusive networks, to become a large open network connecting users from anywhere around the world. This move proved successful, as after 10 years Facebook use has grown to unprecedented levels for a social networking site.

Statistics released by Facebook in 2013 suggested that there were 198 million monthly active users of Facebook in the USA and Canada, 272 million in Europe, 339 million in Asia, and 346 million in the rest of the world. These figures show the extraordinary worldwide reach of Facebook. While there was some evidence that the number of active Facebook users was slowing in previous years, a phenomenon referred to as “Facebook fatigue”, recent independent statistics suggest that use of Facebook has actually grown by 35% over 2012-2013. This has been attributed to Facebook’s push into the mobile market, as well as an influx of older users (Brett, 26 April, 2013).

4.3. What is Facebook?

Due to the ubiquity and popularity of Facebook, it is unnecessary to provide a detailed description of the many features of the site. However, an overview of some of the major features available in 2014 is useful, particularly in light of the fact that Facebook regularly evolves to meet the changing needs of both its users and creators. At the current time, Facebook users can upload and share content to their Timeline. The Timeline acts as a personal profile page, and presents a collated
digital life history featuring the shared content of the user. Facebook (2013) describes the Timeline as a place where users can “share and highlight [their] most memorable posts, photos and life events”. The typical sort of content posted to the Timeline includes photos, videos, interesting web-links, status updates, and check-ins at interesting locations. Important dates such as graduations, births, engagements and marriages can also be included. Other Facebook users can publicly acknowledge content that is posted on a users’ Timeline by clicking the Like link, or they can contribute their thoughts and feedback by leaving a Comment.

One of the other main features of Facebook is the ‘News Feed’, which is a personalised, real-time, aggregated stream of content and information. The information that is visible on a Facebook user’s News Feed is curated by the user themselves; content posted by the user’s Facebook friends is included, as are posts related to their favourite businesses, products, celebrities, artists, movies, hobbies, and so forth. As the News Feed updates in real-time, it essentially provides a constantly updating stream of information. With the News Feed, Facebook users can generally expect to find new and interesting content that is targeted to them every time they return to Facebook.

Aside from adding or viewing new content, Facebook users can also perform many other activities on the site. For instance, they can interact with other users by posting public messages or content on the Timelines of friends, fan pages, or businesses. They can also send private messages to other users through the Message or Chat applications. Users can also play Games by themselves or with others, join Groups to view information or make new friends, and create invitations for real world occasions using Events.

4.4. Facebook Use

As already mentioned, Facebook membership has reached unprecedented levels for an SNS. Due to this, social scientists have been interested in discovering who is using this site and for what purposes. In order to examine these discoveries, the following section provides an overview of research relating to Facebook use. Rather than being an exhaustive review of Facebook related literature, this section focuses primarily on research that may be relevant to the development of addiction to Facebook.

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14 Comments allow for more detailed and personalised feedback than Likes.
4.4.1. Membership of Facebook. Table 4.1 provides details regarding Facebook membership rates; that is, the percentage of individuals from a particular population who are members of the site. As can be seen, the majority of these studies found that around 93-94% of students\textsuperscript{15} were Facebook members. However, some researchers did report slightly lower rates (e.g., Hargittai, 2007; Lampe et al., 2006). These differences may be explained by sampling issues. In both of these studies, the sample comprised first year students. This suggests that first year students in 2006 and 2007 may have been introduced to Facebook during their first year of university. In support of this, Lampe et al. measured Facebook membership rates again after six months and found that it had increased to 95.5%. This makes sense, as Facebook was still in a growth phase during this time period and access may have still been limited to some university students.

In more recent research studies, the rate of Facebook membership among university students is not generally reported (e.g., Smock, Ellison, Lampe, & Wohn, 2011; Tosun, 2012; Wise & Alhabash, 2010). This is most likely because Facebook has grown in popularity to such a degree that it is assumed that the majority of students are now using the site. Alternatively, some researchers only choose to target samples of Facebook users in their studies (e.g., Foregger, 2008; Pempek, Yermolayeva, & Calvert, 2009), which restricts their ability to report membership rates. However, in one recent study, Thompson and Lougheed (2012) found that 94% of a sample of 268 (predominantly freshman) college students were using Facebook. This result is consistent with the membership rates recorded in earlier studies, suggesting that Facebook membership has remained stable over time, at least among the undergraduate student population in the USA. However, additional studies are necessary to confirm this supposition. Further research should also examine Facebook membership rates in non-student samples.

4.4.2 Time spent on Facebook. In light of the popularity of Facebook, it is interesting to consider how users are spending their time on the site. Table 4.2 provides the results of studies that have provided an average minute value\textsuperscript{16} when reporting on daily Facebook use. Coincidently, all of these studies were conducted in North America using student samples. Apart from some outliers (e.g., Foregger, 

\textsuperscript{15} The fact that all of the studies listed in Table 4.1 were based on US university samples reflects the nature of the research rather than any \textit{a priori} inclusion criteria.

\textsuperscript{16} This inclusion criterion was chosen due the fact this it allows for more precise results than providing a range of time.
Table 4.1

Membership Rates of Facebook Between 2006 and 2012

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Year</th>
<th>Sample</th>
<th>Membership rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boogart</td>
<td>2006</td>
<td>3149 resident students (68% women, 99.6% undergraduate) from Kansas State University, Samford University, the University of Florida, and the University of Kansas, USA</td>
<td>94</td>
</tr>
<tr>
<td>Lampe, Ellison, &amp; Steinfeld</td>
<td>2006</td>
<td>1085 first year students from Michigan State University, USA</td>
<td>84</td>
</tr>
<tr>
<td>Ellison et al.</td>
<td>2007</td>
<td>286 undergraduate students (66% women) from Michigan State University, USA</td>
<td>94</td>
</tr>
<tr>
<td>Hargittai</td>
<td>2007</td>
<td>1060 first year students (56% women) from University of Illinois, USA</td>
<td>86</td>
</tr>
<tr>
<td>Foregger</td>
<td>2008</td>
<td>185 communications students from Michigan State University, USA</td>
<td>96</td>
</tr>
<tr>
<td>Steinfield, Ellison, &amp; Lampe</td>
<td>2008</td>
<td>481 undergraduate students (67% women) from Michigan State University, USA</td>
<td>94</td>
</tr>
<tr>
<td>Sheldon</td>
<td>2008</td>
<td>172 communications students (57% women) from Louisiana State University, USA</td>
<td>93</td>
</tr>
<tr>
<td>Valenzuela, Park, &amp; Kee</td>
<td>2009</td>
<td>2603 students, aged 18 to 29, from two public universities in Texas, USA</td>
<td>94</td>
</tr>
<tr>
<td>Hart</td>
<td>2011</td>
<td>163 final year high school students (57% women) from USA</td>
<td>93</td>
</tr>
<tr>
<td>Hart</td>
<td>2011</td>
<td>199 undergraduate university students (65% women) from USA</td>
<td>93</td>
</tr>
<tr>
<td>Lai</td>
<td>2011</td>
<td>599 first year students (62.5% women) from Michigan State University, USA</td>
<td>99</td>
</tr>
<tr>
<td>Thompson &amp; Lougheed</td>
<td>2012</td>
<td>268 students in introductory health classes at Coastal Carolina University, USA</td>
<td>94</td>
</tr>
</tbody>
</table>

2008; Lai, 2011), the studies in this table suggest that daily Facebook usage has grown heavier over time, with studies in the last couple of years indicating that average daily usage excessed an hour and a half per day.

The rapid increase in daily Facebook use since 1996 might reflect the fact that
restrictions on Facebook membership were eased in 2006, which caused an influx of new Facebook users. This increase in membership would have provided existing users with more opportunities for browsable content and social interactions.

Table 4.2

**Average Time (in Minutes) Spent on Facebook Per Day from 2006 Onwards**

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Year</th>
<th>Sample</th>
<th>Minutes spent on FB per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steinfield et al.</td>
<td>2006</td>
<td>92 undergraduate students (74% women) from Michigan State University, USA</td>
<td>33</td>
</tr>
<tr>
<td>Steinfield et al.</td>
<td>2007</td>
<td>92 undergraduate students (74% women) from Michigan State University, USA</td>
<td>54</td>
</tr>
<tr>
<td>Foregger</td>
<td>2008</td>
<td>185 introductory communications students from Michigan State University, USA</td>
<td>97</td>
</tr>
<tr>
<td>Muise, Christofides &amp; Desmarais</td>
<td>2009</td>
<td>308 undergraduate students (75% women) from Canada</td>
<td>39</td>
</tr>
<tr>
<td>Soon</td>
<td>2010</td>
<td>143 undergraduate students (51% women) from Rochester Institute of Technology, USA</td>
<td>46</td>
</tr>
<tr>
<td>Stefanone Lackaff, &amp; Rosen</td>
<td>2011</td>
<td>311 introductory communications students (49.8% women) from a USA university</td>
<td>56</td>
</tr>
<tr>
<td>Ferrell</td>
<td>2011</td>
<td>87 undergraduate students (59% women) from the University of Central Oklahoma, USA</td>
<td>105</td>
</tr>
<tr>
<td>Lai</td>
<td>2011</td>
<td>599 first year students (62.5% women) from Michigan State University, USA</td>
<td>101</td>
</tr>
<tr>
<td>Junco</td>
<td>2012a</td>
<td>2368 students (64% women) at a primarily residential university in the USA</td>
<td>101</td>
</tr>
<tr>
<td>Junco</td>
<td>2012b</td>
<td>1839 undergraduate students (64% women) at a primarily residential university in the USA</td>
<td>106</td>
</tr>
<tr>
<td>Thompson &amp; Lougheed</td>
<td>2012</td>
<td>268 students in introductory health classes at Coastal Carolina University, USA</td>
<td>107</td>
</tr>
</tbody>
</table>

*Note: All studies asked for daily use information using self-report estimation.*

However, an alternative explanation could also be the fact that the News Feed was also introduced in late 2006 (Facebook, 2014). The News Feed is designed to encourage users to return to Facebook multiple times per day to check for newly posted content and updates.

*4.4.3. Frequency of Facebook use.* In support of the latter explanation,
several studies from the USA published after 2006 revealed that students were visiting Facebook multiple times per day. For instance, in a sample of 340 communications students, Foregger (2008) found that participants logged into Facebook around 5.56 times per day on average, for an average time commitment of 17.4 minutes per login. In another study, Pempek et al. (2009) reported that students logged in multiple times a day, and that the amount of time spent by students on Facebook was not affected by how busy the students were. The results of the latter study hint at the importance of Facebook in students’ lives, as they were prepared to make time to use it irrespective of their schedules. As will be discussed later, this attitude may be associated with habitual Facebook use.

More recent studies demonstrate that many students are still checking Facebook multiple times per day. Kittinger et al. (2012) found that 23% of US university students visited Facebook daily, 39% visited more than once a day, and 21% visited more than five times a day. Another US-based study of 110 university students revealed that, on average, students were checking Facebook seven times per day (Junco, 2013). Elsewhere in the world, there is also evidence for frequent Facebook use. In a study from Turkey, Tosun (2012) measured Facebook usage in a sample of 143 university students. Of this sample, 45% admitted visiting Facebook more than once a day. However, 29% only visited once a day and 18% visited less than once a day. While the results relating to multiple daily visits to Facebook are similar to those found in the USA, it appears as if Turkish students are less likely to check Facebook daily than US students. This discrepancy may be indicative of cultural differences between the two countries, or it may reflect contrasting academic attitudes.

In another study from outside the USA, Hew and Chung (2012) examined Facebook use in 83 Singaporean students of Chinese heritage. The authors reported that 45% logged in to Facebook on a daily basis, 30% logged in once a week, and 20% logged in once a fortnight. These results suggest that Chinese students from Singapore do not use Facebook as frequently as students from the USA and Turkey. This result is surprising, given that a large market research study conducted in 2012 found that Singaporeans are among the heaviest Facebook users in the world, spending an average of 20 active hours on the site per month (Rock Publicity, 2012). These contrasting results could be due to age, as the majority (34%) of Facebook users in Singapore are aged 25-34 (socialbakers, 2014). Moreover, the academic commitments of students might necessitate that they spend less time on Facebook
than non-students.

In the general population, there has been limited research investigating frequency of Facebook use. In one of the few studies to address this, Joinson (2008) reported that 39% of participants visited Facebook daily, and 28% visited more than once a day. These results suggest that some Facebook users in this population are returning to the site multiples times per day, perhaps to check the News Feed. However, more recent research is needed to confirm that this still is the case.

4.4.4. Why do people use Facebook? Since Facebook first began its rise in popularity, researchers have attempted to delineate the motivations of its users. In one of the first studies to report on the reasons for Facebook usage, Boogart (2006) recruited a sample of 3,149 on-campus residential students from four universities in the USA. Students were asked three Likert-type questions about why they used Facebook, and the descriptive results revealed that 82% of the sample did so to stay connected with old high school friends. As the entire sample comprised on-campus residential students, who had most likely moved away from their home towns for the first time, it could be argued that the need to keep in touch with old friends would have been very important to this particular sample. However, similar findings were also reported in other studies (Ellison et al., 2007), in samples comprising both residential and non-residential students.

It seems that, in the early years at least, the primary motivation for Facebook use among university students was to keep in touch with friends made in childhood and adolescence. This makes sense, as the Network feature made it easy for users to look up and connect with existing friends and acquaintances. Lampe et al. (2006) refer to this sort of activity as social searching, as users search for individuals that they already share an offline connection with. However, the Network feature also gave users the opportunity to look up and connect with new contacts within networks, such as other students within their current university. Lampe et al. refer to this sort of activity as social browsing, as it involves using Facebook to make new connections, which are then taken offline into ‘real life’.

Several early studies of Facebook looked at whether university students primarily engaged in social searching or social browsing on Facebook. Lampe et al. (2006) were among the first, recruiting a sample of 1,085 first year students from the USA. The researchers asked the students several survey questions about their social activities on Facebook. The results indicated that students were very likely to use Facebook for the purposes of social searching, but that they rarely engaged in social
browsing. In another study, Ellison et al. (2007) asked similar questions of 286 undergraduate students. The results supported those found by Lampe et al.; the majority of students agreed that they had engaged in social searching on Facebook, but did not use the site to make new acquaintances. Boogart (2006) also found similar results; only 21.1% of students in his study agreed that they used Facebook to meet new people.

Based on the results of these three studies, it seems that university students do not join Facebook to make new social connections, at least not in 2006 and 2007. Instead, the popularity of Facebook during this time may have been motivated by the desire to connect and interact with existing friends. In this regard, Facebook differs from older forms of online social applications, like chat rooms and newsgroups, which were primarily used for the formation of new relationships (Ellison et al. 2007). Instead, Facebook has an offline to online focus, which adds weight to the argument that it should be conceptualised as distinct from other SNSs.

4.4.4.1 Uses and gratifications of Facebook. In more recent years, researchers have used a uses and gratifications framework to investigate the reasons behind Facebook use. In order to investigate these results, a literature search was performed using the academic databases ProQuest (including PsycInfo), Science Direct, and Web of Science. These databases were selected as they provide access to a large number of scientific peer-reviewed journal articles and theses from multiple disciplines.

Searches were performed using the terms Facebook, social networking sites, social network sites, motivations, and uses and gratifications. Research was included in the review if it measured the motivations of Facebook use in general; therefore, studies were excluded if they only focused on specific features of Facebook (i.e. a particular Facebook game). Furthermore, given that the present section was focused on the uses and gratifications of Facebook, rather than those of other SNSs, studies were excluded if they measured aggregated uses and gratifications for multiple SNSs (even if they included Facebook). Factors identified from 24 Facebook related uses and gratifications studies are displayed in Table 4.3.

When the factors in Table 4.3 are compared, some clear patterns emerge. In 14 out of the 16 studies where the percentage of variance for each factor was reported, the factors accounting for the majority of the variance relate to either relationship maintenance or passing time. In this context, relationship maintenance involves interacting with existing members of an individual’s existing offline social network.
The fact that this was a common use of Facebook makes sense in light of the results relating to social searching (Lampe et al., 2006). Clearly, many Facebook users view the site as a useful tool to facilitate social interaction with existing friends and family. In this regard, Facebook differs from many older online social applications, such as discussion boards and newsgroups, which were primarily used for the formation of new relationships. Instead, Facebook appears to have an offline-to-online social focus (Ellison et al., 2007).

In regard to passing time, this factor reflects the habitual use of Facebook to occupy time when bored, or to procrastinate from other activities (Foregger, 2008; Sheldon, 2008). Using Facebook for this purpose may potentially involve such activities as checking the News Feed for new updates, or playing games. Papacharissi and Mendelson (2011) refer to such use as ritualised, and indicate that this type of use reflects “the addictive nature of the genre” (p. 226). Interestingly, Hart (2011) reported that using Facebook for passing time was the most important motivation for high school students, whereas relationship maintenance was for university students. Based on this, it seems that further research is needed to examine the role that age plays in predicting the importance of uses and gratifications of Facebook. On the other hand, Hart's results may instead be associated with a less obvious variable, such as the number of important long distance relationships an individual has (which may be greater among university students), or the amount of free time the user has available (which may be greater among high school students).

If the remaining factors in Table 4.3 are compared, some appear across multiple studies, such as entertainment, companionship, social investigation, and information seeking. Although these factors tend to account for less variance in their respective analyses than relationship maintenance and passing time, several of them are worth discussing briefly for the further insights they provide into the motivations of Facebook usage. For instance, fifteen studies include a factor relating to the use of Facebook for entertainment purposes. This factor reflects the enjoyment of using Facebook to engage in socially passive activities, such as looking at user-generated content on the site, or playing games. In essence, the entertainment factor appears similar in nature to the more popular passing time factor. However, the latter appears to be motivated more by task avoidance, procrastination, or filling time, while the
Table 4.3

*Uses and Gratifications of Facebook*

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Year</th>
<th>Sample</th>
<th>Motivations</th>
<th>Variance explained (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foregger</td>
<td>2008</td>
<td>340 introductory communications students (62% women) from Michigan State University, USA</td>
<td>Pass Time</td>
<td>32.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Connection</td>
<td>7.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sexual Attraction</td>
<td>5.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Utilities and Upkeep</td>
<td>3.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Establish/Maintain Old Ties</td>
<td>2.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Accumulation</td>
<td>2.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Social Comparison</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Channel Use</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Networking</td>
<td>1.8</td>
</tr>
<tr>
<td>Joinson</td>
<td>2008</td>
<td>137 Facebook users (64% women), with a mean age 26 years</td>
<td>Social connection</td>
<td>59^a</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Shared identities</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Photographs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Content</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Social investigation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Social network surfing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Status updating</td>
<td></td>
</tr>
<tr>
<td>Sheldon</td>
<td>2008</td>
<td>172 communications students (57% women) from Louisiana State University, USA</td>
<td>Relationship maintenance</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Passing time</td>
<td>11.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Virtual community</td>
<td>5.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Entertainment</td>
<td>4.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Coolness</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Companionship</td>
<td>4</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Year</td>
<td>Sample</td>
<td>Motivations</td>
<td>Variance explained (%)</td>
</tr>
<tr>
<td>-------------------------</td>
<td>------</td>
<td>------------------------------------------------------------------------</td>
<td>-------------------------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Sheldon</td>
<td>2009</td>
<td>260 communications students (58% women) from Louisiana State University, USA</td>
<td>Relationship maintenance, Passing time, Entertainment, Virtual community</td>
<td>31.1, 9.7, 4.8, 4.1</td>
</tr>
<tr>
<td>Cheung, Chiu, &amp; Lee</td>
<td>2011</td>
<td>182 Facebook users (68% women, 86% students)</td>
<td>Social presence, Entertainment value, Social enhancement, Group norms, Maintaining interpersonal interconnectivity</td>
<td>Not reported</td>
</tr>
<tr>
<td>Hart</td>
<td>2011</td>
<td>163 final year high school students (57% women) from USA</td>
<td>Passing time, Relationship maintenance, Entertainment, Information seeking</td>
<td>29.3, 10.4, 7.5, 5.3</td>
</tr>
<tr>
<td>Hart</td>
<td>2011</td>
<td>186 undergraduate university students (65% women) from USA</td>
<td>Relationship maintenance, Passing time, Entertainment, Information seeking</td>
<td>38.4, 9.3, 7.2, 4.8</td>
</tr>
<tr>
<td>Papacharissi &amp; Mendelson</td>
<td>2011</td>
<td>344 Facebook users (64.3% women). 85% were undergraduate university students from USA</td>
<td>Habitual pass time, Relaxing entertainment, Expressive information sharing, Cool and new trend, Companionship, Professional advancement, Escape</td>
<td>11.4, 10.5, 9.4, 7, 6.8, 6.7, 6.6</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Year</td>
<td>Sample</td>
<td>Motivations</td>
<td>Variance explained (%)</td>
</tr>
<tr>
<td>----------------------</td>
<td>------</td>
<td>------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Smock et al.</td>
<td>2011</td>
<td>267 undergraduate communications students (65% men) from a large Midwestern USA university</td>
<td>Social interaction, Habitual pass time, Relaxing entertainment, Expressive information sharing, Escapism, Cool and new trend, Companionship, To meet new people, Professional advancement</td>
<td>Not reported</td>
</tr>
<tr>
<td>Alhabash, Park, Kononova, Chiang, &amp; Wise</td>
<td>2012</td>
<td>4,346 Taiwanese Facebook users (59% women) with a mean age of 30 years.</td>
<td>Social connection, Photographs, Social investigation, Status updates, Social network surfing, Content, Shared identities</td>
<td>5.87, 3.48, 3.36, 2.72, 2.70, 2.50, 2.44</td>
</tr>
<tr>
<td>Hunt, Atkin, &amp; Krishnan</td>
<td>2012</td>
<td>417 undergraduate students. No further demographic information about participants was provided.</td>
<td>Interpersonal utility, Passing time, Information seeking, Entertainment, Self-expression</td>
<td>Not reported</td>
</tr>
<tr>
<td>Special &amp; Li-Barber</td>
<td>2012</td>
<td>127 undergraduate Psychology students (71% women) from a small southeastern USA university.</td>
<td>Relationship maintenance, Passing time, Entertainment, Coolness, Virtual community, Companionship</td>
<td>Not reported</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Year</td>
<td>Sample</td>
<td>Motivations</td>
<td>Variance explained (%)</td>
</tr>
<tr>
<td>---------------------</td>
<td>------</td>
<td>------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Tosun</td>
<td>2012</td>
<td>143 Turkish university students (74% women)</td>
<td>Managing long-distance relationships</td>
<td>12.98</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Passive activities</td>
<td>11.84</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Initiating/terminating romantic relationships</td>
<td>10.23</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Establishing new relationships</td>
<td>10.14</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Active forms of photo-related activities</td>
<td>8.25</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Game/entertainment</td>
<td>7.67</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Organising events</td>
<td>7.42</td>
</tr>
<tr>
<td>Valentine</td>
<td>2012</td>
<td>350 Internet users over (69% women) from the USA. All were over 35 years of age</td>
<td>Interpersonal habitual entertainment</td>
<td>37.54</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Virtual companionship</td>
<td>9.65</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Information seeking</td>
<td>5.73</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Self expression</td>
<td>3.91</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Passing time</td>
<td>3.45</td>
</tr>
<tr>
<td>Yang &amp; Brown</td>
<td>2012</td>
<td>193 university students (54% women) from a large Midwestern USA university</td>
<td>Relationship formation</td>
<td>0.30</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Relationship maintenance</td>
<td>0.10</td>
</tr>
<tr>
<td>Balakrishnan &amp; Shamim</td>
<td>2013</td>
<td>707 university students from Malaysia (54% women)</td>
<td>Social networking</td>
<td>35.10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Psychological benefits</td>
<td>10.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Entertainment</td>
<td>8.72</td>
</tr>
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<td></td>
<td>Self presentation</td>
<td>5.26</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Skill enhancement</td>
<td>3.32</td>
</tr>
<tr>
<td>Giannakos, Chorianopoulos, Giotopoulos, &amp;</td>
<td>2013</td>
<td>222 Facebook users (56% men), with a mean age of 26 years</td>
<td>Wasting time</td>
<td>32.20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Social connection</td>
<td>14.54</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Social surfing</td>
<td>13.42</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Year</td>
<td>Sample</td>
<td>Motivations</td>
<td>Variance explained (%)</td>
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</tr>
<tr>
<td>Vlamos</td>
<td></td>
<td></td>
<td>Using applications</td>
<td>9.24</td>
</tr>
<tr>
<td>Pai &amp; Arnott</td>
<td>2013</td>
<td>24 Taiwanese Facebook users (50% women) aged 20-40 years</td>
<td>Belonging</td>
<td>Not reported</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hedonism</td>
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<td>Self-esteem</td>
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<td></td>
<td></td>
<td></td>
<td>Reciprocity</td>
<td></td>
</tr>
<tr>
<td>Spiliotopoulos &amp; Oakley$^a$</td>
<td>2013</td>
<td>208 Facebook users (55.8% men) from 30 different countries</td>
<td>Social connection</td>
<td>69.01</td>
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<tr>
<td></td>
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<td>Shared identities</td>
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<td>Social investigation</td>
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<td></td>
<td>Newsfeed</td>
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<tr>
<td>Teppers, Luyckx, Klimstra, &amp; Goossens</td>
<td>2014</td>
<td>256 senior high school students (64% girls) from Belgium</td>
<td>Entertainment</td>
<td>Not reported</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Maintaining relationships</td>
<td></td>
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<td></td>
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<td></td>
<td>Social skills compensation</td>
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<td>Social inclusion</td>
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<td></td>
<td>Meeting people</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Decrease loneliness</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Personal contact</td>
<td></td>
</tr>
<tr>
<td>Aladwani</td>
<td>2014</td>
<td>378 student Facebook users from a university in Kuwait (55% men)</td>
<td>Connecting</td>
<td>24.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sharing</td>
<td>10.40</td>
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<td></td>
<td>Organising</td>
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<td></td>
<td>Branding</td>
<td>7.11</td>
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<td></td>
<td></td>
<td></td>
<td>Expressing</td>
<td>6.82</td>
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<td></td>
<td></td>
<td></td>
<td>Monitoring</td>
<td>6.70</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>Learning</td>
<td>6.37</td>
</tr>
<tr>
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<td></td>
<td>Relaxing</td>
<td>5.80</td>
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<tr>
<td>Author(s)</td>
<td>Year</td>
<td>Sample</td>
<td>Motivations</td>
<td>Variance explained (%)</td>
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<td>-------------------</td>
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<td>------------------------</td>
</tr>
<tr>
<td>Alhabash, Chiang, &amp; Huang</td>
<td>2014</td>
<td>3172 Taiwanese Facebook users (50% women)</td>
<td>Information sharing</td>
<td>78.99</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Self-expression</td>
<td>74.83</td>
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<td>Self-documentation</td>
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<td></td>
<td>Medium appeal</td>
<td>70.57</td>
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<td>Socialisation</td>
<td>70.05</td>
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<td>Entertainment</td>
<td>61.90</td>
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<td></td>
<td></td>
<td></td>
<td>Escapism</td>
<td>54.16</td>
</tr>
<tr>
<td>Hollenbaugh &amp; Ferris</td>
<td>2014</td>
<td>301 Facebook users (77% women), with a mean age of 31.85 years</td>
<td>Virtual community</td>
<td>18.13</td>
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<td></td>
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<td></td>
<td>Companionship</td>
<td>17.45</td>
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<td></td>
<td>Exhibitionism</td>
<td>14.68</td>
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<tr>
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<td></td>
<td>Relationship maintenance</td>
<td>14.63</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Passing time</td>
<td>6.71</td>
</tr>
<tr>
<td>Shoenberger &amp; Tandoc, Jr.</td>
<td>2014</td>
<td>123 students from a large Midwestern USA university</td>
<td>Affectation</td>
<td>26.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bandwagon</td>
<td>14.83</td>
</tr>
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<td>Self-expression</td>
<td>11.18</td>
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<td>Entertainment</td>
<td>7.09</td>
</tr>
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<td>Escape</td>
<td>6.05</td>
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<tr>
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<td>Companionship</td>
<td>5.04</td>
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<td>Excitement</td>
<td>4.44</td>
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<tr>
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<td></td>
<td></td>
<td>Sociability</td>
<td>3.40</td>
</tr>
</tbody>
</table>

*Individual variances for each factor were not provi
former reflects planned usage for the purposes of pleasure seeking. In Sheldon’s (2008) study, the entertainment factor had a high mean score, which as Sheldon points out, highlights the importance of this motivation for Facebook use. Another factor of interest is companionship, which was present in six out of the 24 studies illustrated in Table 4.3. This factor taps into the use of Facebook to avoid loneliness and gratify interpersonal needs. Similarly, two other studies included motivations that related to decreasing loneliness. Given the link between loneliness and Internet Addiction mentioned in Chapter 3, it is possible that this factor may be related in some way to the development of Facebook Addiction. It is interesting to note that in Valentine’s (2011) study, top-loading variables in the companionship factor related to the use of Facebook to escape from worries and problems. Such items may be suggestive of mood regulation, which, as mentioned earlier in the previous chapter (see Section 3.4.2) is linked to addiction of online social applications (Caplan, 2010). However, none of the uses and gratifications studies reviewed here explicitly referred to this dimension. Instead, they appear to use the term escape, which was included in four out of 24 studies.

4.4.4.2 Variables associated with uses and gratifications of Facebook. As stated earlier, there may be a relationship between uses and gratifications and the development of Facebook Addiction. Therefore, it is worth looking in some detail at the variables associated with certain Facebook use motivations. This section will include the most frequently reported variables associated with uses and gratifications of Facebook: gender, frequency of use, and time spent on Facebook.

Gender. Of the studies presented in Table 4.3, five examine the association between gender and uses and gratifications of Facebook (Hunt et al., 2012; Joinson, 2008; Sheldon, 2009; Spiliotopoulos & Oakley, 2013; Teppers et al., 2014). In all of these studies, women were more likely to use Facebook for connecting with existing contacts. In Joinson’s (2008) study, women were also more likely to use Facebook to view updates. In contrast, Sheldon (2009) found that men were more likely to be motivated by making new friends or forming new romantic relationships on Facebook. Although Facebook has changed since Sheldon’s study was published, a recent study by Spiliotopoulos and Oakley (2013) also found that men prefer to use Facebook to engage in social network browsing.

The above results point to a fundamental difference between women and men in their uses and gratifications of Facebook; women prefer to use the site to maintain their existing social networks, while men may prefer to use it to expand their social
networks. Given that past research has linked Internet Addiction with a tendency to prefer communicating with new online friends (e.g., Morahan-Martin & Schumacher, 2000; Young, 1996), it is possible that men may be more likely to fail to regulate their online communication and become addicted to Facebook. However, recent research has found that women are heavier users of Facebook than men (Foregger, 2008). In light of these conflicting results, it is clear that researchers should examine the difference that gender differences play in the development of Facebook Addiction. It may be the case that men are simply interested in passively browsing Facebook users and content, while women are more actively engaging with their social networks. On the other hand, there may be multiple pathways to addiction, and these are mediated by different communicative motivations.

*Frequency of use.* In Joinson’s study (2008), frequency of Facebook use was found to be associated with what he called *surveillance gratifications.* This involves looking at user-generated content, such as photographs and status updates. Similarly, Hart (2011) reported that the entertainment gratification was a significant variable in a model predicting the frequency of Facebook use in both undergraduate and high school students. These results imply that passively engaging with social or entertainment-related content on Facebook can motivate users to use the site more frequently. This kind of use may be associated with checking for real-time updates on the News Feed, as the content will generally be updated regularly. Such behaviour may be tapping into what is anecdotally referred to as *fear of missing out* or *FOMO* (Przybylski, Murayama, DeHaan, & Gladwell, 2013); however, this warrants further investigation.

Interestingly, Papacharassi and Mendelson (2011) found that people who used Facebook more frequently develop a greater affinity with the site, especially when they use it to escape from negative emotions. As already discussed, the use of online applications for mood regulation is associated with deficient self-regulation and negative outcomes (Caplan, 2010). Therefore, it is possible that this aspect of the social skill model of Generalised Problematic Internet Use is relevant to the use of Facebook. While more in-depth research to support this theory is required, it is plausible that lonely or socially anxious individuals may feel more connected with others when checking the News Feed for recent updates, or when receiving messages or comments from friends. If so, this may lead such users to check the site frequently, in order to attain the negative reinforcement of mood alteration.

*Time spent on Facebook.* In regard to the duration of time spent on Facebook,
Joinson (2008) found that this was predicted by what he called *content gratifications*. This involves engaging in non-social Facebook activities, such as playing games, searching applications, and completing quizzes. Similarly, Foregger (2008) found that using Facebook to pass time and explore social connections led to more time spent on Facebook per day. Taken together, these findings suggest that individuals who spend a lot of time on Facebook per day do so for different reasons than those who check Facebook frequently. For example, rather than passively engaging with posted social content in the way that frequent users do, heavy users tend to be gratified by game playing or social observation.

In contrast to the assumption above, Hart (2011) discovered that using Facebook for entertainment and relationship maintenance significantly contributed to a model predicting the amount of time spent on Facebook per day. This opposing result can potentially be explained by changes made to Facebook after 2008. In particular, Facebook added the real-time synchronous instant messaging application ‘Chat’ in April of that year (Wiseman, 6 April, 2008). This feature may have encouraged some Facebook users to spend more time on the site for social purposes, such as chatting with their friends and family. Furthermore, Alhabash et al. (2012) reported that Facebook intensity was predicted by the desire to share personal information via status updates. These results suggest that socially active Facebook activities, such as Chat and status updates may be associated with heavy Facebook use. One potential explanation for this trend is that the use of these applications increases the chance of receiving comments and messages from other users. For some individuals, such as those who are lonely, receiving this type of feedback could provide relief from feelings of social isolation and reinforce the use of these applications. In support of this, Yang and Brown (2012) found that the use of status updates was associated with higher levels of loneliness, while Teppers et al. (2014) reported that lonely adolescents were more likely to use the socially interactive applications of Facebook than non-lonely adolescents.

4.5. Facebook Abuse

Since the very early days of its use, Facebook has had the potential to become addictive. In a study performed as early as 2006, Boogart surveyed 3149 US university students and 31.3% admitted that were addicted to Facebook. However, somewhat surprisingly, research in this area has lagged in comparison to research relating to other aspects of Facebook use.
In order to examine existing literature relating to Facebook Addiction, a literature search of the academic databases ProQuest, ScienceDirect, and Web of Science was conducted. Searches were performed using the terms ‘addiction’, ‘problematic’, ‘abuse’, ‘compulsive’, ‘excessive’, ‘social networking sites’, ‘social network sites’, and ‘Facebook’. As this thesis was focused specifically on Facebook Addiction, studies were excluded if they focused on addiction to SNSs in general (even if this included Facebook) and only provided combined results from these multiple sites in an aggregated format. This criterion was necessary to ensure that results relating to other SNSs were excluded. For similar reasons, studies considering the role of Facebook use in relation to Internet Addiction were also excluded. As shown in Table 4.4, only nine studies of Facebook Addiction were located.

The results of the studies summarised in Table 4.4 suggest that Facebook Addiction is associated with being male, (Çam & Işbulan, 2012), being a heavy Facebook user (Hong et al., 2014; Koc & Gulyagci, 2013), and being in a higher year level at university (Çam & Işbulan, 2012). Facebook Addiction was also linked to certain psychological variables, such as relationship dissatisfaction (Elphinston & Noller, 2011), depression (Hong et al., 2014; Koc & Gulyagci, 2013), anxiety (Koc & Gulyagci, 2013), subjective happiness, and subjective vitality (Uysal et al., 2014). In terms of the symptoms of Facebook Addiction, support was found for the existence of preferences for online social interaction, mood regulation, deficient self-regulation, negative outcomes (Lee et al., 2012), salience, loss of control, withdrawal, relapse (Balakrishinan & Shamim, 2013), and tolerance (Zaremohzzabieh et al., 2014).

Within Section 4.4.4.2, three themes were discussed that could potentially be related to the development of Facebook Addiction: habitual use, heavy or frequent use, and using Facebook for mood regulation. The following subsections will look at each of these topics in turn, incorporating findings from Table 4.4 where relevant. Following this, a section on the measurement of Facebook Addiction will be provided.

**4.5.1. Habitual Facebook use.** Research by Pempek et al. (2009) (discussed in Section 4.4.3) suggested that Facebook use might become habitual in university students. An earlier study by Ellison et al. (2007) using a sample of 286 undergraduate students from the USA also found similar results. The researchers revealed that many students felt that using Facebook had become a part of their daily routine. Adding to this picture, another survey study of 119 college students from the USA found that many respondents considered Facebook to be an important daily activity (Debatin, Lovejoy, Horn, & Hughes, 2009). Furthermore, there was a
### Table 4.4

**Systematic Review of Facebook Addiction Studies**

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Year</th>
<th>Sample</th>
<th>Type of study</th>
<th>Measure</th>
<th>Variables</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elphinston &amp; Noller</td>
<td>2011</td>
<td>342 Australian undergraduate students (57% women)</td>
<td>Quantitative cross-sectional survey study</td>
<td>8-item Facebook Intrusion Questionnaire</td>
<td>Facebook intrusion, jealousy, relationship satisfaction</td>
<td>Facebook intrusion is associated with relationship dissatisfaction through jealousy and surveillance behaviours</td>
</tr>
<tr>
<td>Sofiah et al.</td>
<td>2011</td>
<td>380 Malaysian university students (100% women)</td>
<td>Quantitative cross-sectional survey study</td>
<td>11-item unnamed measure of Facebook Addiction</td>
<td>Facebook Addiction, uses and gratifications of Facebook</td>
<td>Social interaction, passing time, entertainment, companionship and communication motives were all associated with Facebook Addiction</td>
</tr>
<tr>
<td>Çam &amp; İşbulan</td>
<td>2012</td>
<td>1257 teaching candidates from a Turkish university (59% women)</td>
<td>Quantitative cross-sectional survey study</td>
<td>20-item Facebook Addiction Scale</td>
<td>Facebook Addiction, gender, year of study</td>
<td>Men were more likely than women to be addicted to Facebook, and senior students were more likely to be addicted than juniors, sophomores, and freshmen.</td>
</tr>
<tr>
<td>Lee et al.</td>
<td>2012</td>
<td>200 Facebook users (52% women)</td>
<td>Quantitative cross-sectional survey study</td>
<td>7-item modified version of the Generalised Problematic Internet Use Scale 2 (Caplan, 2010)</td>
<td>Problematic Facebook use</td>
<td>Preference for online social interaction and using Facebook to regulate moods significantly predicted deficient self-regulation of Facebook use. This relationship led to negative outcomes.</td>
</tr>
<tr>
<td>Balakrishnan &amp; Shamim</td>
<td>2013</td>
<td>Focus group: 12 Malaysian university</td>
<td>Qualitative focus group study/</td>
<td>30-item unnamed measure of Facebook Addiction</td>
<td>Facebook Addiction, uses and gratifications of Facebook</td>
<td>Evidence was presented to support four key indicators of Facebook Addiction: Salience, Loss of Control, Withdrawal,</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Year</td>
<td>Sample</td>
<td>Type of study</td>
<td>Measure</td>
<td>Variables</td>
<td>Findings</td>
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<tr>
<td>Koc &amp; Gulyagci</td>
<td>2013</td>
<td>447 Turkish university students</td>
<td>Quantitative cross-sectional survey study</td>
<td>8-item Facebook Addiction Scale</td>
<td>Facebook Addiction, Facebook use, psychosocial health</td>
<td>22% of the variance in Internet addiction scores was predicted by weekly time spent on Facebook, social motives, depression and anxiety</td>
</tr>
<tr>
<td>Hong et al.</td>
<td>2014</td>
<td>241 Taiwanese university students</td>
<td>Quantitative cross-sectional survey study</td>
<td>12-item Facebook Addiction Scale</td>
<td>Facebook Addiction, Facebook usage, gender, year of study, self-esteem, social extraversion, sense of self-inferiority, neuroticism, depressive character</td>
<td>Facebook Addiction was significantly predicted by level of Facebook usage and having a depressive character</td>
</tr>
<tr>
<td>Uysal et al.</td>
<td>2014</td>
<td>297 Turkish university students</td>
<td>Quantitative cross-sectional survey study</td>
<td>18-item Bergen Facebook Addiction Scale (Andreassen, Torsheim, Brunborg, &amp; Pallesen, 2012)</td>
<td>Facebook Addiction, subjective vitality, subjective happiness</td>
<td>The relationship between subjective vitality and subjective happiness was partially mediated by Facebook Addiction</td>
</tr>
<tr>
<td>Zaremohzzabieh et al.</td>
<td>2014</td>
<td>9 heavy Facebook users from a Malaysian university (67% men)</td>
<td>Qualitative interview study</td>
<td>Semi-structured interview questions</td>
<td>Facebook Addiction</td>
<td>Three themes emerged: compulsion to check Facebook, high frequency Facebook use, and using Facebook to avoid offline responsibility. These themes were respectively classified as salience, tolerance, and conflict.</td>
</tr>
</tbody>
</table>
significant relationship between this belief and the frequency of Facebook use.

LaRose et al. (2010) suggest that results such as those outlined above point to the habit-forming nature of social networking. This is linked to the development of deficient self-regulation of use, which may eventually lead to addiction. As Section 4.4.4.1 revealed, this habitual use appears to be predominantly associated with the gratification of passing time, which reflects task avoidance and procrastination (Foregger, 2008; Sheldon, 2008). Both LaRose et al. (2010) and Papacharissi and Mendelson (2011) have suggested that habitual use of SNSs can lead to the development of addiction.

One of the first studies to examine the addictive potential of Facebook was performed by Elphinston and Noller (2011). The aim of the study was to investigate whether Facebook Addiction, or Facebook intrusion as the authors called it, could be related to problems in real life romantic relationships. The results showed that participants commonly agreed that they often used Facebook for no particular reason, they felt connected to others when they use Facebook, and they lose track of how much they are using Facebook. Similarly, Sofiah et al. (2011) found that many participants agreed that Facebook had become part of their daily routine, they stayed on Facebook longer than intended, and that they felt out of touch when they hadn’t logged onto Facebook for a while. The above results again highlight the propensity for Facebook use to lead to deficient self-regulation, through habitual and unmonitored use. In Elphinston and Noller’s (2011) study, this kind of use was found to be associated with real life negative outcomes, specifically problems with romantic relationships.

The results of the study by Sofiah et al. (2011) also revealed that the gratification of using Facebook to pass time accounted for 17% of the variance in Facebook Addiction scores. Further, using Facebook for the combined motives of passing time, entertainment, and communication accounted for 24% of variance. These results both support and extend the findings discussed in Section 4.4.4.1, and further suggest that the habitual use of Facebook for passing time may put users at risk of Facebook Addiction.

4.5.2. Excessive Facebook use. Two of the studies listed in Table 4.4 reported that higher levels of Facebook use were linked to Facebook Addiction (Hong et al., 2014; Koc & Gulyagci, 2013). These results are not surprising, given that online addictions researchers have previously pointed to a link between heavy Internet usage and Internet Addiction (e.g., Tonioni et al., 2012). In fact, many
scholars have used the term "excessive Internet use" interchangeably with the term Internet Addiction (e.g., Anderson, 2001; Aboujaoude et al., 2006). This trend is most likely due to the popular belief that spending a large amount of time performing a particular behaviour, such as exercise or eating chocolate, is an indicator of the presence of addiction (Leon & Rotunda, 2000).

As it turns out, there are mixed views on this argument. Both Caplan (2005) and Griffiths (1999) point out that excessive time spent online does not automatically qualify an individual as addicted. There are many non-problematic Internet behaviours that would involve extended periods of time online, such as study or work-related research. However, while not all people who spend large amounts of time on Facebook per day are necessarily addicted, due to the role that deficient self-regulation is thought to play, it makes sense that Facebook addicts would generally be heavy users.

Typically, research has found that women are heavier Facebook users than men (Kittenger et al., 2012; Thompson & Lougheed, 2012), most likely due to their involvement in using the site for the purposes of relationship maintenance (Spiliotopoulos & Oakley, 2013). While this trend might be considered to represent a higher likelihood of women becoming addicted to Facebook than men, a recent study of Turkish teaching candidates actually found that the opposite was true (Çam & Işbulan, 2012). Clearly, further research should examine the links between gender and Facebook Addiction. In regards to age, younger people are generally reported to be heavier users than older people (Foregger, 2008, Joinson, 2008, Valenzuela et al., 2009). This is possibly because they have more spare time to spend using Facebook, and higher levels of social engagement within the site.

Research relating to the uses and gratifications of Facebook has indicated that time spent on Facebook per day is related to content gratifications (Joinson, 2008), passing time (Foregger, 2008), and relationship maintenance (Hart, 2011). Frequency of Facebook use has also found to be associated with using Facebook for entertainment (Hart, 2011) and surveillance gratifications (Joinson, 2008). This suggests that there are several different gratifications associated with both heavy and frequent Facebook use, and again, not all are socially focused.

4.5.3. Facebook use for mood regulation. Evidence suggests that Facebook may be used by lonely people to gain a sense of companionship (Sheldon, 2008; Foregger, 2008), and to help them escape from their worries and problems (Valentine, 2011). People who used Facebook to escape from unwanted moods were
found to use Facebook more frequently and to develop a greater sense of affinity with the site (Papacharassi & Mendelson, 2011). As discussed in Section 3.4.2, Caplan (2007) found that loneliness is associated with Internet Addiction, and that this relationship is mediated by social anxiety. Caplan's (2010) social skill model demonstrates that people who prefer communicating in online situations are more likely to use the Internet for mood regulation, which then leads to deficient self-regulation. It appears that this may also be an issue in the development of Facebook Addiction. Supporting this view, Lee et al. (2012) found that having a preference for online social interaction and using Facebook for mood regulation explained 35% of the variance in deficient self-regulation of Facebook use. In turn, deficient self-regulation of Facebook use had a direct outcome on the experience of negative life outcomes.

While not measuring mood alteration directly, two other studies (Hong et al., 2014; Koc & Gulyagci, 2013) provided evidence to support a relationship between low psychosocial health (depression and anxiety) and Facebook Addiction. These findings may indicate that depressed and anxious people turn to Facebook to find relief and escape. These results align with Davis' (2001) cognitive behavioural theory, which states that the existence of some form of psychopathology is a necessary cause for the development of Internet Addiction. Furthermore, the positive association between social motives and Facebook Addiction also supports Caplan's (2010) social skill theory.

4.5.4. Measuring Facebook Addiction. Due to the fact that Facebook Addiction is an emerging field, there has been a lack of unification regarding the measurement of this potential disorder. As shown in Table 4.5, early researchers in this domain have tended to create their own measures based on research from related fields, or have borrowed and modified an existing measure of Internet Addiction. This process is similar to what occurred with Internet Addiction research, as discussed in Chapter 2. As previously argued, this approach contributed to the conceptual chaos of Internet Addiction, and should therefore be avoided.

In support of the above argument, some of the results in Table 4.5 highlight inconsistency in measurement. For instance, both the Facebook Intrusion Questionnaire (Elphinston & Noller, 2011) and the Bergen Facebook Addiction Scale (BFAS; Andreassen et al., 2012) include factors tapping into salience, withdrawal and relapse; however, that is where the similarities between these measures end. Likewise, there are more differences than similarities between the GPIUS2 (Caplan,
### Table 4.5

**Table of Facebook Addiction Measures**

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Year</th>
<th>Measure</th>
<th>Influenced by</th>
<th>Items</th>
<th>Scoring</th>
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</table>
| Elphinston & Noller | 2011 | Facebook Intrusion Questionnaire | Mobile phone involvement questionnaire and Brown's (1997) behavioural addictions criteria | I often think about Facebook when I'm not using it  
I often use Facebook for no particular reason  
Arguments have arisen with others because of my Facebook use  
I interrupt whatever else I am doing when I feel the need to access Facebook  
I feel connected to others when I use Facebook  
I lose track of how much I am using Facebook  
The thought of not being able to access Facebook makes me feel distressed  
I have been unable to reduce my Facebook use | 7-point scale | None provided |
| Sofiah et al. | 2011 | Untitled                         | Not reported                                       | Facebook has become part of my daily routine  
I find that I stay on Facebook longer than I intended  
I feel out of touch when I haven’t logged onto Facebook for a while  
I think life without Facebook would be boring  
I tend to spend more time in Facebook over going out with others  
I often spent time playing games with friends through Facebook  
I often think about Facebook when I am not using it  
I often lose sleep due to late-night logins to Facebook  
I neglect everyday responsibilities to spend more time on Facebook  
My priority is to log on to Facebook rather than doing other things  
My grades are getting lower because of the amount of time I spend on Facebook | 7-point scale | None provided |
| Andreassen et al. | 2012 | Bergen Facebook Criteria of behavioural | How often during the past year have you:  
Spent a lot of time thinking about Facebook or planned use of | | 5-point scale | None provided |
<table>
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<th>Author(s)</th>
<th>Year</th>
<th>Measure</th>
<th>Influenced by</th>
<th>Items</th>
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| Addiction Scale<sup>ab</sup> | 2012 | Facebook Addiction Scale | Based on pathological gambling research. Wording was based on scale of gaming addiction. | Facebook? (Salience)  
Felt an urge to use Facebook more and more? (Tolerance)  
Use Facebook in order to forget about personal problems (Mood modification)  
Tried to cut down on the use of Facebook without success? (Relapse)  
Became restless or troubled if you have been prohibited from using Facebook? (Withdrawal)  
Use Facebook so much that it has had a negative impact on your job/studies? (Conflict) | 6-point scale | None provided |
| Çam and İşbulan (2012)     | 2012 | Facebook Addiction Scale | Modified version of Young’s (1998) Internet Addiction Test | How often do you:  
Stay on Facebook longer than intended  
Neglect household chores to spend more time on Facebook  
Prefer the excitement of Facebook to intimacy with a partner  
Form new relationships with fellow Facebook users  
Hear others complain about the amount of time you spend on Facebook  
Grades or school-work suffers because of time spent on Facebook  
Check Facebook messages before something else that needs to be done  
Job performance or productivity suffers because of Facebook  
Become defensive or secretive when asked about Facebook activity  
Block out disturbing thoughts about your life with soothing thoughts of Facebook  
Find yourself anticipating when you will go on Facebook again  
Fear that life without Facebook would be boring, empty, and joyless  
Snap, yell, and act annoyed if someone bothers you while you are on Facebook  
Lose sleep due to late night Facebook logins  
Feel preoccupied with Facebook when offline, or fantasise about being on Facebook  
Say to yourself “just a few more minutes” when on Facebook  
Try to cut down the amount of time spent on Facebook and fail  
Try to hide how long you’ve been on Facebook | 6-point scale | None provided |
<table>
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<tr>
<th>Author(s)</th>
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</table>
| Lee et al.                | 2012 | GPIUS2<sup>a</sup>               | Modified version of the Generalised Problematic Internet Use Scale 2 (Caplan, 2010) | Choose to spend more time on Facebook over going out with others  
Feel depressed, moody, or nervous when offline, and having this feeling go away once back on Facebook  
I want to, or have made unsuccessful efforts to, cut down or control my Facebook use (Deficient self-regulation)  
I have attempted to spend less time on Facebook but have not been able to (Deficient self-regulation)  
I have tried to stop using Facebook for long periods of time (Deficient self-regulation)  
I am preoccupied with Facebook if I cannot log on for some time (Deficient self-regulation)  
When not on Facebook, I wonder what is happening on there (Deficient self-regulation)  
I feel lost if I can’t go on Facebook (Deficient self-regulation)  
I have used Facebook to talk with others when I was feeling isolated (Mood regulation) | Scoring: 5-point scale  
Cut off: None provided                                                                 |
| Balakrishnan & Shamim     | 2013 | No title provided<sup>a</sup>    | Brown's (1997) behavioural addiction criteria                                 | I spent a lot of time on Facebook (Salience)  
I might log into Facebook at least once daily (Salience)  
I constantly check for updates (Salience)  
Most of the time I spend on the Internet is for Facebook (Salience)  
I always reply to comments by my friends (Salience)  
Facebook has become part of life (Salience)  
I have the constant urge to update my status on Facebook (Salience)  
I go through my own profile regularly reading all the older posts (Salience)  
I use Facebook to check on people I met offline (Salience)  
I would be lost without Facebook (Salience)  
I think of Facebook when I am offline (Salience)  
Sometimes I think of Facebook while in my lecture/meeting/discussion (Salience)  
I think Facebook is the greatest invention ever (Salience)  
I lose sleep at times due to late night log-ins to Facebook (Loss of control)  
I feel lost when I didn’t use Facebook for sometime (Loss of control) | Scoring: 5-point scale  
Cut off: None provided                                                                 |
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<th>Author(s)</th>
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<th>Items</th>
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<tbody>
<tr>
<td>Koc &amp; Gulyagci</td>
<td>2013</td>
<td>Facebook Addiction scale</td>
<td>Previous research on Internet Addiction</td>
<td>I do not think I can stop using Facebook (Loss of Control) Facebook is affecting my offline life (academic, social life, etc.) (Loss of Control) I check every comment, photo, or video uploaded on my Facebook (Loss of Control) I am always online on Facebook so as not to miss any updates (Loss of Control) Sometimes I access the Internet just to get on Facebook (Loss of Control) I lose track of time when I am on Facebook (Loss of Control) I get annoyed when someone disturbs me when I am using Facebook (Loss of Control) I get disappointed when I could not access Facebook (Withdrawal) I get disappointed when my friends are not online (Withdrawal) I get disappointed when my friend request is rejected (Withdrawal) I have deactivated my account before but I have activated it again (Withdrawal) I always look forward to using Facebook Others have commented that I spend too much time on Facebook Using Facebook is affecting my studies/work I log into Facebook to make myself feel better when I am down I feel anxious if I cannot access Facebook I have attempted to spend less time on Facebook but have not succeeded</td>
<td>5-point scale</td>
<td>None provided</td>
</tr>
<tr>
<td>Author(s)</td>
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<tr>
<td>Hong et al.</td>
<td>2014</td>
<td>Facebook Addiction Scale&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Modified version of Young's (1998) Internet Addiction Test</td>
<td>When you are not on Facebook, you will feel sad, in low spirits, and anxious, but after going on Facebook, these feelings will disappear (Withdrawal) When you are not on Facebook, will you still think about being on Facebook or imagine that you are on Facebook? (Withdrawal) You would rather spend more time on Facebook than go out to spend time with people (Withdrawal) The time I spent on Facebook usually exceeds what I expected (Tolerance) I will overlook academic work to spend time on Facebook (Tolerance) Before I have to do something, I will check my Facebook to see if there is new information or there are games to play (Tolerance) When people ask me what I do on Facebook, I will become more defensive or private (Life problems) Because I spend too much time on Facebook, my academic work or grades have been affected (Life problems) My academic performance and attention have been affected by Facebook (Life problems) I like to make new friends on Facebook (Substitute satisfaction) I have discovered that I want to be on Facebook again (Substitute satisfaction) I am scared that without Facebook, life will become boring, empty, and uninteresting (Substitute satisfaction)</td>
<td>6-point scale</td>
<td>None provided</td>
</tr>
</tbody>
</table>

<sup>a</sup>These measures have been subjected to factor analysis.

<sup>b</sup>This paper was not included in Table 2 as it is an instrument development study rather than a Facebook Addiction study.
and the BFAS, although both include a mood-related factor (mood alteration/mood modification) and a negative outcomes factor (negative outcomes/conflicts). These examples underscore a lack of construct validity surrounding Facebook Addiction. Moreover, they highlight the inconsistencies underlying behavioural addictions research in general.

As Facebook is an application of the Internet, it could be argued that out of the measures presented in Table 4.5, the GPIUS2 presents the best option for measuring Facebook Addiction. However it does not provide any cut-off point for recognising problematic use (Spraggins, 2009), nor does it include a temporal dimension (Griffiths, 2000b). For researchers moving forward with their investigations of Facebook Addiction, the development of a unique measure of problematic Facebook use would be of great benefit.

In order to overcome this problem, researchers at the University of Bergen in Norway set out to create and test a dedicated measure of Facebook Addiction: the BFAS (Andreassen et al., 2012). They started out by identifying six core elements of addiction (salience, mood modification, tolerance, withdrawal, conflict, and relapse), which they derived from behavioural addictions research by Brown (1997) and Griffiths (1996). As both of those authors worked in the field of pathological gambling, the BFAS is primarily based on criteria from the domain of gambling addiction. However, the authors state that the wording of items was influenced by the Gaming Addiction Scale (Lemmons, Valkenburg, & Peter, 2009).

The BFAS originally consisted of 18 items, which included three items for each of the six symptoms of behavioural addiction. However, after the scale was administered to 423 college students in Norway, the researchers chose to retain only one item per symptom (Andreassen et al., 2012). In all cases, the item that was kept was the one with the highest corrected item-total correlation. These items are presented in Table 4.5. The authors reported that psychometric properties of the scale were good, with a factor structure of .99, and a coefficient alpha of .83. Furthermore, the reliability and validity of the scale were found to be adequate.

The BFAS represents a positive first step towards the development of a reliable and valid measure of problematic Facebook use. However, the fact that it has been based on criteria associated with pathological gambling is a point of possible contention. While it is true that pathological gambling is recognised in the DSMIV-TR (APA, 2000) and Internet Addiction is not, it could be argued that Internet Addiction research bears more relevance to Facebook use. For instance, Caplan's (2010)
research has provided evidence that preference for online communication is the key factor associated with the development of problematic use of online forms of communication. Given the findings of Lee et al. (2012; see Section 4.5.2), it seems that preference for online social interaction is also an important predictor of Facebook Addiction. Thus, this symptom is arguably an important factor to include in a measure of Facebook Addiction.

Furthermore, given the unprecedented popularity of Facebook with Internet users across the world, it is possible that there may be other unique aspects associated with the development of addiction to this site that have not been identified by past research into Internet Addiction. For instance, Facebook involves a primarily offline-to-online social focus, as mentioned previously. This is something that has not typically been explored in Internet Addiction research. Based on these assertions, further in-depth research is required to determine exactly which symptoms are associated with Facebook Addiction. This will have the valuable outcome of informing the development of an instrument of Facebook Addiction that comes closer to achieving construct validity.

4.6. Summary

The aim of this chapter was to examine the factors relating to Facebook use and abuse. By examining research in this area, it has become clear that Facebook use is pervasive, and occurs daily for the majority of users. The use of the site has increased over time, as has the frequency of use. In terms of the motivations of users, there are several various uses and gratifications, but the main factors tend to be relationship maintenance and passing time. Interestingly, the overwhelming majority of Facebook research has been based on samples of university students from the USA. This trend is likely due to the fact that the site originated as a US-based SNS for university students. While it is clear that Facebook use has now expanded beyond student users into the general population, research based on more diverse populations is lacking.

In terms of Facebook Addiction, when all of the findings discussed here are considered together, they paint the following picture: individuals with pre-existing psychopathology are motivated to use Facebook, generally either to find social support or to pass time. The lift in mood that this provides them positively reinforces their use of Facebook for mood regulation, which in turn leads to deficient self-regulation. In severe cases, this can eventually lead to negative life consequences.
Viewed in this way, it appears as if Facebook Addiction develops in a similar way to Generalised Internet Addiction. The following chapter discusses the design of a research study that aimed to examine the veracity of these assumptions.
Chapter 5
Project Methodology and Research Design

In the previous chapter, examination of the literature surrounding Facebook use and abuse indicated that Facebook use could become addictive for certain people. As mentioned in Chapter 1, the primary aim of this thesis is to explore Facebook Addiction in detail. The present chapter describes the methodology and research design that was used to achieve this aim. In Section 5.1, the research questions associated with this thesis (first proposed in Section 1.2) are reintroduced. These research questions can now be considered in light of the detailed literature review provided in Chapters 2, 3, and 4. The remainder of this chapter introduces the methodology used to answer the five research questions. In addition, an overview of the research design is also presented.

In the initial stages of research planning, a three-phase, mixed methods exploratory design was selected. As will be explained in Chapter 7, the second phase of this design did not produce an extensive enough set of data to successfully answer the research questions, or to move on to the proposed third phase. As a result, a revised design was implemented. In order to present these amendments in a clear and precise manner, the current chapter will provide a general overview of both the initial and revised designs. In addition, details about the methods used in Phase 1 and Phase 2 will also be provided. A detailed discussion of the methods used in Phase 3, emerging from Phases 1 and 2, will be presented in Chapter 8.

5.1. Research Questions

In Chapter 1, the five guiding research questions underlying this thesis were introduced. At that point, they were presented as a way of focusing the literature review that followed. Having now examined the relevant literature in the preceding chapters, each of the research questions will now be discussed in more detail. This reintroduction serves to both reinforce the motivations for conducting this research study, as well as providing the necessary rationale for the chosen design.

RQ1. What are the common symptoms underlying measures of Internet Addiction?
The relevance of RQ1 hinges on the fact that Internet Addiction research was used as a guiding framework for examining the potential components of Facebook Addiction in this thesis. As a result, it is important to understand the construct validity of this adopted framework. However, applying symptoms of Internet Addiction to measure Facebook Addiction is not a straightforward process. As argued in Chapter 2, Internet Addiction research currently lacks consistency. For example, there are multiple sets of criteria for Internet Addiction but diagnostic manuals, such as the *DSM-5* (APA, 2013), have endorsed none. There are also multiple existing Internet Addiction measures; however, none have attained gold standard recognition at this point in time. Furthermore, these measures were each derived in different ways, with varying underlying factors and dimensional structures. In addition, very few measures have been based on theory or subjected to rigorous psychometric testing.

Faced with this level of inconsistency, it was difficult to identify a clear set of symptoms that could be said to represent the experience of Internet Addiction. One way to create some consistency was to perform an in-depth review of Internet Addiction measures. The results could then be used to identify the commonly measured symptoms underlying this construct. Once this has been achieved it would be possible to adapt these symptoms to measure Facebook Addiction.

**RQ2. Can a common set of Internet Addiction symptoms be used to identify Facebook addicts?**

In essence, RQ2 asks whether there is any evidence to suggest that Facebook Addiction exists, based on pre-existing themes associated with a conceptually related disorder (Internet Addiction). One way to achieve this is to ask self-identified problematic Facebook users whether they have experienced any of the symptoms commonly related to Internet Addiction in the context of their Facebook use. If this were the case, it would provide preliminary evidence to suggest that Facebook Addiction can be measured using symptoms of Internet Addiction. This was the approach taken in this thesis. If evidence were found to suggest that Facebook Addiction does exist, it would be appropriate to ask more specific research questions about the symptoms, forms, and predictors of this disorder.

**RQ3. Is there any indication that there are symptoms or indicators of Facebook Addiction that are unique from the common set of Internet Addiction symptoms?**
The relevance of this question rests on the argument that, while each type of behavioural addiction may involve some similar components, it is also possible for unique symptoms or indicators to occur. Support has been found for this line of reasoning in two of the most heavily researched forms of behavioural addictions: Pathological Gambling and Internet Addiction. For example, the symptom of *chasing losses* has been identified as a unique element of Pathological Gambling, as it does not occur in other forms of addiction\(^{17}\). Moreover, Chapter 3 discussed the notion that preference for online social interaction is considered to be a measurable component of generalised Internet Addiction (Caplan, 2010). Like chasing losses, preference for online social interaction has not been found in other forms of addiction, which indicates that it is a unique symptom of Internet Addiction. Based on these examples, it was considered likely that Facebook Addiction would also involve unique symptoms.

**RQ4. Does Facebook Addiction take different forms?**

As outlined in Chapter 4, there are several different uses and gratifications of Facebook. Therefore, it is plausible that there may be different pathways to Facebook Addiction. This was found to be the case for Internet Addiction, as previously discussed in Section 3.3. However, at this point in time, most Internet Addiction measures do not take these different forms into account. Due to this limitation, these measures have been criticised for lacking specificity (Griffiths, 2000b). Likewise, for Facebook, Griffiths (2012) explains that there are numerous potentially addictive activities in which Facebook users can engage, such as gambling, game playing, and updating their profiles. Therefore, RQ4 needs to be answered, particularly at this early stage of Facebook Addiction research. In doing so, more will be known about potential pathways to Facebook Addiction. In addition, it will be possible to construct valid measures with which to measure this disorder, and design appropriate interventions.

**RQ5. Do certain demographic, behavioural, or attitudinal variables predict Facebook Addiction?**

Although this topic has not been discussed in detail in the previous chapters, the literature relating to Facebook abuse (as presented in Section 4.5) suggests that this may be the case. For example, women and young people are often found to be

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\(^{17}\) This topic will be discussed in more detail in Section 5.2.1.
heavy Facebook users. Furthermore, individuals who use Facebook heavily may be at risk of developing Facebook Addiction. The identification of predictors of Facebook Addiction would be a useful addition to the Facebook Addiction literature, as it will allow for more focused research and clinical treatment in the future. Therefore, this research question was deemed to be germane to the present thesis.

5.2. Selecting a Methodology

The focus of this chapter now turns to the selection of an appropriate methodology. In the past, scholars interested in researching Internet Addiction typically proceeded in a deductive manner, by adapting existing models from conceptually related disorders, and using them to test potential Internet addicts (i.e., Brenner, 1997; Scherer, 1997; Young, 1996). However, as discussed in Chapter 2, this approach has been inconsistent, and has lead to a degree of conceptual confusion. As a result, it seemed appropriate to look outside the field of Internet Addiction to devise a more suitable methodology for this thesis. In doing so, it became apparent that the DSM criteria for Pathological Gambling might hold the answer.

In Chapter 2, the point was made that basing Internet Addiction research on symptoms of Pathological Gambling and substance-related disorders is not an entirely useful approach. Therefore, the decision to design a study of Facebook Addiction based on Pathological Gambling criteria may seem to be an odd choice. However, it is not the criteria themselves that are of interest to the present study. Instead it is the processes involved in their creation that are deemed to be useful. The reason for this is simple; Pathological Gambling is the only form of behavioural addiction to be officially recognised in the DSM. Thus, it provides a potentially useful exemplar for selecting a methodology and design for the present study.

5.2.1. Development of Pathological Gambling criteria. Diagnostic criteria relating to Pathological Gambling first appeared in the appendix of the DSM-III (APA, 1980). At first, these criteria were not empirically derived or tested before their inclusion. Instead, they were based entirely on the clinical expertise of mental health professionals who specialised in treating the disorder (Committee on the Social and Economic Impact of Pathological Gambling et al., 1999; Reilly & Smith, 2013). This method of developing criteria relied heavily on inductive reasoning. Rather than grounding the criteria in theory, they were instead based upon qualitative observations of symptoms that were common to the sample of patients in treatment.
These symptoms were then assumed to relate to all pathological gamblers.

Over time, some experts began to criticise these inductively derived criteria for their lack of generalizability (Committee on the Social and Economic Impact of Pathological Gambling et al., 1999). Their argument stemmed from the fact that the criteria were based on the symptoms and experiences of a limited sample of patients. In short, the criteria had not been subjected to a confirmatory study using deductive reasoning. This was a substantial limitation, and led to the abandonment of the first iteration of criteria during the editing process for the *DSM-III-R* (APA, 1987). Instead, they were replaced with a completely new set of criteria, which were developed by rewording the *DSM-III* (APA, 1980) criteria for Substance Dependence.

In order to develop this second set of criteria, a deductive approach was taken. Criteria from a more deeply researched field of study (Substance Dependence) were applied to a newer and less understood phenomenon (Pathological Gambling). However, these revised criteria were also the subject of criticism from treatment professionals (Lesieur & Rosenthal, 1991). This time, the criticism reflected the fact that Substance Dependence criteria did not account for gambling-specific criteria, such as chasing losses.

At this point, the Pathological Gambling criteria were amended for a third time for the release of the *DSM-IV* (APA, 1994; Committee on the Social and Economic Impact of Pathological Gambling et al., 1999). For this iteration, the two previous sets of criteria were merged and tested in a clinical population for their ability to differentiate problem gamblers from non-problem gamblers (Lesieur & Rosenthal, 1991). This strategy, involving the amalgamation of criteria developed from both inductive and deductive techniques, in conjunction with empirical testing in clinical populations, was subject to less criticism than previous iterations. These more well rounded criteria have persisted, largely unchanged, into the current version of the *DSM* (*DSM-5*; APA, 2013; Reilly & Smith, 2013). While the current criteria are not without their critics, they have certainly endured longer than the previous iterations. Moreover, they are based upon more solid foundations.

### 5.2.2. Developing a methodology for a study of Facebook Addiction.

The trial and error that occurred during the development of the Pathological Gambling criteria provides valuable lessons for researchers interested in new forms of behavioural addictions. Based on the experiences described above, it makes sense to employ a combination of inductive and deductive logic when exploring a new addictive disorder. This should then be followed by extensive confirmatory research.
Unfortunately, this process did not occur during the genesis of Internet Addiction research, and is most likely responsible for at least some of the inconsistency that has emerged within the field. In an attempt to avoid repeating the errors of the past, the selected methodology for this thesis combined both inductive and deductive reasoning.

At this point in time, most of what is known about Facebook Addiction comes from clinical observations and anecdotal accounts reported in the media. While empirical research is beginning to emerge, it has primarily been based on concepts borrowed from other disorders (see Chapter 4). As highlighted in Chapter 2, this approach is problematic, as it lacks specificity to the phenomenon under investigation. By performing only deductive quantitative studies, important findings that are unique to the experience of Facebook Addiction may be neglected. As argued by Stebbins (2001) “exploration and inductive reasoning are important in science in part because deductive logic alone can never uncover new ideas and observations” (p. 8). Therefore, there is a strong rationale for the use of mixed methods in order to examine Facebook Addiction.

5.3. Mixed Methods Research

Traditionally, research methodologies are generally classified as either qualitative or quantitative. Broadly speaking, quantitative research involves a top-down approach; the first step is the identification of theory, followed by the generation of hypotheses. The final step is the collection of quantifiable data, which are then analysed to either support or falsify the hypotheses (Creswell & Plano Clark, 2007). Quantitative researchers tend to place importance on research that is deductive (Bryman, 2012), and collect data that is closed-ended (Creswell & Plano Clark, 2007) and measurable (Thomas, 2003).

On the other hand, qualitative research is often associated with open-ended data or naturalistic observation (Creswell & Plano Clark, 2007). In contrast to quantitative research, qualitative inquiry often involves a bottom-up approach. Rich descriptive data is collected in the first instance, and is then interpreted and used to engender potential theories (Creswell & Plano Clark, 2007). Thus, qualitative methods are known to be inductive, as they are focused on the generation of theories rather than the testing of them (Bryman, 2012).

The guiding principle of mixed methods research is that both “qualitative and quantitative approaches in combination provides a better understanding of research
problems than either approach alone” (Creswell & Plano Clark, 2007, p. 5).

According to Brannen (2008), mixed methods research affords researchers the opportunity to think outside the square, which can be particularly advantageous when investigating emerging constructs. As explained above, this was considered to be a useful approach to adopt when answering the research questions guiding this thesis.

However, some critics of the mixed method approach tend to dismiss it as a methodological fad. For instance, Bergman (2008) points out that quantitative researchers feel that they must always include an element of qualitative research into their design to improve the marketability of their projects. Bryman (2008) also draws upon this point, and claims that the use of mixed methods is “often insufficiently justified” (p. 87). To avoid such criticisms in relation to the present thesis, a rationale supporting the use of mixed methods has been provided below.

5.3.1. Mixed methods rationale. In his book, Social Research Methods, Bryman (2008) presents a content analysis of 232 mixed methods research studies, and summarises the rationales commonly espoused by researchers when using mixed methods designs. The results suggested that there are 16 possible justifications for employing a mixed methods design: triangulation, offset, completeness, process, different research questions, explanation, unexpected results, instrument development, sampling, credibility, context, illustration, utility, confirm and discover, diversity of views, and enhancement (for more detailed information, see Bryman, 2008). In the present thesis, the implementation of a mixed methods design can be justified in two important ways, both of which are mentioned in the list above. The first relates to potential enhancement of the findings, while the second concerns the different types of research questions being asked. Both of these rationales will now be explained in further detail.

The notion of enhancement refers to the rationale of “making more of or augmenting either quantitative or qualitative findings by gathering data using a qualitative or quantitative research approach” (Bryman, 2008, p. 9). In this thesis, the argument was made that relying on borrowed measures alone does not provide the most complete way of investigating an emerging disorder. This is because simply applying one set of symptoms to another disorder does not allow for the discovery of unique symptoms. Given this standpoint, it would be contradictory to proceed with a purely quantitative study, as other Facebook Addiction researchers have previously done. However, given that there is a vast body of existing Internet Addiction research available, it seems unnecessary to conduct a study that is entirely qualitative either.
Therefore, the best way forward appears to be using a mixture of qualitative and quantitative research methods, as this approach should enhance the findings of the study. This allows for the combination of deductive and inductive reasoning, as demonstrated in the Pathological Gambling example provided in Section 5.2.1.

The second justification refers to the use of both qualitative and quantitative components of a mixed research design to answer different research questions (Bryman, 2008). A discussion of each research question was provided in Section 5.1 of this chapter, and although it was not discussed explicitly, this section indicated that RQ1 to RQ4 would best be answered using qualitative data. On the other hand, RQ5 supports the use of quantitative research principles. These differences will be discussed in further detail in the upcoming section.

5.4. Research Design

Having settled upon the research methodology, the next step was to create a research design. Figure 5.1 shows the flow and structure of the initial research design that was developed for this study. The design was organised into three phases: a qualitative systematic review phase (Phase 1), a qualitative focus group phase (Phase 2), and a quantitative survey phase (Phase 3). The rationale underlying the selection of this design and method is provided below. However, as will be discussed in further detail in Chapter 7, Phase 2 of this research design did not generate enough data to allow for Phase 3 to continue as originally planned. As a result, it was necessary to revise the methodology and design for Phase 3. While the revised design will be introduced in Section 5.4.3, it is important to first explain and justify the components of the original research design.

5.4.1. Phase 1. Early in this chapter, it was posited that Internet Addiction research could provide a guiding framework to investigate Facebook Addiction. However, lack of consistency within the latter field, in conjunction with the potential existence of unique symptoms and experiences of Facebook Addiction, indicates that this framework should not be viewed as a prescriptive pathway. Instead, it should only be considered a basis for performing further exploratory investigations. This argument provides the foundation for the development of Phase 1.

Phase 1 was primarily designed to answer RQ1, which asked whether there is a set of common symptoms underlying the construct of Internet Addiction. As explained in Chapter 2, there are currently multiple sets of diagnostic criteria and many suggested symptoms of Internet Addiction. There are also numerous
measurement instruments, with different underlying factor structures. As a result, performing a systematic review of Internet Addiction measures appeared to be an appropriate way of providing an answer to RQ1.

5.4.1.1. Systematic reviews. Systematic reviews involve locating and synthesising existing research on a particular topic of interest, using methods that are explicit, replicable, and transparent (Littell, Corcoran, & Pillai, 2008). Procedures are predetermined for each step in the process, from searching for relevant literature, to extracting data and analysing the findings (Lewis-Beck, Bryman, & Liao, 2004). Systematic reviews provide a disciplined method of reviewing literature, which reduces the effects of bias (Littel et al., 2008). In this way, the systematic review is considered to be a more rigorous method of reviewing existing literature than a traditional narrative review (Lewis-Beck et al., 2004). In the discipline of psychology, many systematic reviews of assessment measures have been performed (e.g., Berne et al., 2013; Humphrey et al., 2011; Vodermaier, Linden, & Sui, 2009). In general, these tend to focus on quantitative elements of the measures, such as reliability and validity. However, to answer RQ1, it was necessary to locate and review existing measures of Internet Addiction and identify the factors that they measure. Therefore, while the type of studies under review were quantitative, the analytic focus was actually on the qualities of the particular measures that were used in the study. Thus, the systematic review used in this thesis was classified as a qualitative review of quantitative studies.

5.4.2. Phases 2 and 3. As depicted in Figure 5.1, Phases 2 and 3 involved a mixed methods research design. In the book, Designing and Conducting Mixed Methods Research, Creswell and Plano Clark (2007) provide classifications of the four major types of mixed methods design: triangulation, embedded, explanatory, and exploratory. As they explain, exploratory designs are useful to examine phenomena when “measures or instruments are not available, the variables are unknown, or there is no guiding framework or theory” (p. 75). In this study, an exploratory mixed methods design appeared to be the most appropriate choice.

5.4.2.1. Exploratory mixed methods designs. Exploratory mixed methods designs generally involve two phases of data collection (Creswell & Plano Clark, 2007). Data are collected sequentially as this allows researchers to obtain a deeper understanding of the topic of investigation. In general, qualitative data are collected first and act as the major source of data for the study. These data are then analysed and used to undertake a quantitative phase of data collection. In sequential mixed
methods designs, the influence of the data is usually weighted in favour of the particular form of data that are collected first. For the purposes of answering RQs 2 to 5, the idea was to first collect exploratory qualitative data (Phase 2), and then flesh out the construct of Facebook Addiction with some supporting quantitative data (Phase 3). This would allow for a deeper understanding of this emerging condition, which is something that a purely quantitative study would not have achieved.

Exploratory designs can be used for two main purposes: instrument development and taxonomy development (Creswell & Plano Clark, 2007). In this thesis, it was intended that the qualitative data were to be thematically analysed and used to design a preliminary measure of Facebook Addiction. This measure would have been tested in the quantitative phase of the study (Phase 3). This design is similar to the process used to create the diagnostic criteria for Pathological Gambling in the *DSM-IV* (APA, 1994), as discussed in Section 5.2.1.

Although the exploratory mixed methods design appeared to be the best choice for this study, Creswell and Plano Clark (2007) mention three challenges associated with its implementation. These are as follows:

- Collecting qualitative data and quantitative data in a sequential fashion is more time consuming than collecting both forms of data at once
- An *a priori* decision has to be made regarding whether the same sample of participants will be used for the first and second phase of the study
- It is difficult to plan the quantitative phase in detail without first knowing the outcome of the qualitative phase

In the present study, issues relating to the time consuming nature of exploratory studies were certainly considered, however, they were not deemed to be a particular source of concern. A schedule was devised to ensure that an appropriate amount of time was allocated to conduct the data collection and analysis stages of Phase 2. This was put in place in order to allow plenty of time for the implementation of Phase 3.

In regard to the second point, sampling issues were also not perceived to be a substantial problem. An *a priori* decision was made that the participants in Phase 2 would be a small sample of self-described problematic Facebook users, which would allow for highly relevant qualitative data to be collected. On the other hand, in Phase 3, the sample would be larger, and consist of general Facebook users. It was
expected that the latter sample would provide the opportunity to compare differences between Facebook users who were considered to be experiencing Facebook Addiction and those who were not.

While the first and second of Creswell and Plano Clark’s (2007) points were not expected to present considerable challenges in the present study, the third point was more of a potential concern. Without being aware of what the findings of Phase 2 would bring, it was difficult to begin planning Phase 3. In fact, as it turned out, the data collection stage of Phase 2 produced unexpected outcomes. This ultimately led to a revised research design for Phase 3, and Phase 2 became a standalone qualitative study. This will be explained further in Section 5.4.3. However, at this point, it is important to attend to a discussion of the methods selected for Phase 2.

5.4.2.2. Phenomenological method. In the discipline of psychology, there are three commonly used forms of qualitative research methods: ethnography, phenomenology, and case study (Howitt, 2010). Ethnography, which includes methods such as participant observation, involves studying individuals, or groups of individuals, in their natural setting. Having immersed themselves in the lives or experiences of the individual, the ethnographer then forms a narrative in order to explain the topic of interest. In contrast, phenomenology requires researchers to learn about the topic of interest by asking individuals, or groups of individuals, about their own perspective. Common forms of ethnography include focus groups and interviews. A case study involves a very detailed examination of a single individual, or group of individuals, using a variety of ethnological and phenomenological techniques. As with ethnography, the aim of the case study is to provide a detailed narrative about the topic of interest.

In selecting a method with which to conduct Phase 2, it was necessary to assess the suitability of each approach to the topic of interest. The ethnological approach was immediately deemed to be unsuitable, for several reasons. First, there was a possibility that potential Facebook addicts would change their behaviours while they were being observed. For instance, participants might limit their Facebook checking or usage, as they are aware that their behaviour is being monitored. Second, it is likely that the symptoms of Facebook Addiction may involve cognitions (i.e., preoccupation) as well as behaviours. An ethnological approach would not necessarily lead to insights about the cognitive aspects of Facebook Addiction. Third, the symptoms of Facebook Addiction are currently unknown, so it would be difficult to

\[18\] This will be explained further in Chapter 7.
ensure that the participants were really addicted to Facebook just through observation. Given that considerable resources would be necessary to conduct ethnographical studies with multiple participants, this was judged to be a risk that was not worth taking.

For similar reasons as those mentioned above, case study was not entirely suitable either. Case study involves building up a detailed picture of the topic of interest by using various qualitative approaches, including ethnology. As ethnology is not an ideal approach to examine Facebook Addiction, the usefulness of the case study would be somewhat diminished. Furthermore, conducting a single case study would not have generated data that was generalizable to the wider population, and conducting multiple in-depth case studies would have taken more resources than were available. In addition, as with the ethnological approach, selecting appropriate participants would have been difficult. For these reasons, the case study approach was rejected.

By a process of elimination, the phenomenological approach was selected as the most appropriate for Phase 2 of the research design as it does not involve observation. Depending on the technique used, phenomenology can also be conducted with multiple participants without investing substantial amounts of money or time. However, perhaps the most important reason for selecting this method of qualitative research is that it involves asking participants about their own experiences of a particular phenomenon. This approach would help to develop an understanding of whether Facebook Addiction actually exists, and if so, what sorts of symptoms are involved.

Having selected the phenomenological method, it was then necessary to decide whether interviews or focus groups would be the best way of collecting data. In his book, Howitt (2010) outlines the differences between these two methods. Qualitative interviews are semi-structured discussions where the researcher acts as interviewer. Generally, the interview is held with a single person at a time, and participants are selected based on their experience with the phenomenon in question. Focus groups, on the other hand, are held with multiple participants at the same time. While the discussion is facilitated using semi-structured questions, the emphasis should be on interactions between group participants.

According to Howitt (2010), qualitative interviews are useful when a researcher wishes to retain a greater degree of control over the direction of conversation. Conversely, a higher level of control over the direction of conversation
tends to diminish the opportunity for unexpected insights about a particular phenomenon. In contrast, focus groups foster interaction between participants, and are less tightly controlled by the researcher. This dynamic is more likely to encourage interesting insights, given that participants have the opportunity to interact with others who have had similar experiences.

As will be pointed out in Chapter 7, Phase 2 was not only designed to confirm the existence of previously identified addiction symptoms among Facebook addicts, but it also aimed to uncover unique aspects of Facebook Addiction. Therefore, while some degree of control over the questioning was necessary, it was also desirable for the research method to engender an environment where participants could provide additional insights about Facebook Addiction. Therefore, the focus group approach appeared to be the most appropriate method. In support of this, Howitt (2010) explains that focus groups can be used as an attempt “to generate information and knowledge in a field which has previously been largely under-researched” (p. 97).

5.4.2.3. Focus groups. Traditionally, focus groups have been carried out in the following way: around eight to twelve participants gather in a room and, facilitated by the focus group moderator (either the researcher or a trained expert), respond to open-ended questions about the research topic of interest (Bender & Ewbank, 1994). The focus group may run for up to two hours (Howitt, 2010), and is generally recorded by the researcher. The resulting data are then transcribed and analysed (Stewart & Williams, 2005). However, since the advent of the Internet, some researchers have been choosing to conduct focus groups online (Franklin & Lowry, 2001; Underhill & Olmstead, 2003). This approach tends to be favoured by researchers working in the field of Internet use (i.e., Cameron et al., 2005; Hillier, Mitchell, & Ybarra, 2012; Kenny, 2005), and thus, it was also chosen for Phase 2.

Compared to traditional focus groups, online focus groups have several benefits. They can take place anywhere in the world, and are often cheaper to run as participants generally provide their own computer and Internet connection (Schneider, Kerwin, Frechtling, & Vivari, 2002). In this way they are also more convenient for participants; there is no requirement to travel or leave the comfort of their own homes. When compared with face-to-face focus groups, the online alternative can be beneficial for discussing sensitive topics, as there is a greater degree of anonymity in online communication (Franklin & Lowry, 2001). Furthermore, online focus groups are less likely to result in an uneven distribution of responses among participants than face-to-face focus groups (Schneider et al., 2002).
One of the disadvantages of online focus groups is that the sample of participants are often less representative of the general population, given that they all must be Internet users (Schneider et al., 2002). However, due to the penetration of Internet use in the developed world, this issue is becoming less of a concern. In addition, this issue is completely negated for researchers investigating Internet-related use or behavior (as is the case in this thesis). Another disadvantage for online focus groups relates to the propensity for participants to fail to show up for the focus group, or drop out (Schneider et al., 2002). One possible way of countering this effect is by offering some kind of incentive for completion of the focus group.

Due to the different mediums of communication available on the Internet, online focus groups can be either synchronous or asynchronous (Bloor, Frankland, Thomas, & Stewart, 2001). Synchronous focus groups can take place using instant messaging applications or online chat rooms, while asynchronous focus groups can be conducted using threaded discussion modalities, such as email groups and discussion boards. As Bloor et al. (2001) explain, there are benefits and limitations to both of these approaches. These will now be discussed.

Synchronous online focus groups are the closest representation of real-life communication; interactions occur in real-time and move rapidly. In this way, synchronous conversation may appear more familiar and natural to focus groups participants (Bloor et al., 2001). However, one of the weaknesses of synchronous communication is that it becomes difficult to manage when the sample consists of participants from different time zones. In addition, this mode of communication allows for multiple streams of conversation to occur at the same time. This is not a desirable outcome, as it lessens the ability of the moderator and other participants to keep track of the conversation. It also makes data analysis more difficult.

Asynchronous online focus groups are suitable for use with participants from different time zones. Furthermore, due to the fact that asynchronous online conversations are organised into specific threads, participants are better able to keep track of conversations (Bloor et al., 2001). This feature also improves ease of data analysis for the researcher. Another advantage of asynchronous focus groups is that they allow participants to take their time and think about their answers. In addition, participants are able to respond at a time that suits them, rather than a time organised by the researcher (Seymour, 2001). One of the disadvantages of asynchronous focus groups is that, depending on the type of medium used, they may not be anonymous (Bloor et al., 2001). For example, when using an email-based
group, participants would be able to see each other’s email addresses. Another weakness relates to the fact that conversation in asynchronous focus groups moves more slowly, which may lead to participants becoming bored and dropping out. Moreover, it can be more difficult for researchers to set up an asynchronous focus group, when compared to using synchronous methods, such as private online chat rooms or instant messaging clients.

For the purposes of this thesis, the decision was made to conduct asynchronous focus groups. This was motivated by two reasons: the desire to include participants from multiple countries and time zones, and the opinion that richer data may result if participants had longer to think about their responses. The last point was especially important to the current study, in light of the potential link between social anxiety and online addictions (i.e., Caplan, 2002). When faced with the choice between using email groups and discussion boards, the latter were chosen. This primarily stemmed from the desire to protect the anonymity of participants, which would be easier to achieve by asking participants to register for the discussion board using a unique pseudonym.

5.4.3. Revised research design. While the methods described above were considered to be appropriate for an exploratory study of Facebook Addiction, the data that was generated in Phase 2 (as will be discussed in Chapter 7) suggested that it would be beneficial to implement a revised research design for Phase 3 (see Figure 5.2). This revised design consisted of a single research phase, wherein the mixed methods data collection occurred simultaneously. In contrast to the sequential exploratory design originally planned, this type of design is known as concurrent triangulation (Creswell & Plano Clark, 2007).

The concurrent triangulation research design is the most common form of mixed methods design. As Creswell and Plano Clark (2007) explain, it allows researchers to collect “different but complementary data on the same topic to best understand the research problem” (p. 62). Following the unexpected data from the original design, the concurrent triangulation design was implemented to collect both qualitative and quantitative data on Facebook Addiction. Qualitative data were thematically analysed in order to provide answers to RQs 2 and 3, and then transformed into quantitative data and analysed in conjunction with the quantitative data to answer RQs 4 and 5.

A concurrent triangulation design compensated for the limitations of the exploratory sequential design. As Creswell and Plano Clark explain (2007), the
triangulation design brings together “the differing strengths and non-overlapping weaknesses of quantitative methods (large sample size, trends, generalisation) with those of qualitative methods (small N, details, in depth)” (p. 62). Furthermore, the concurrent triangulation design is more efficient than other mixed methods designs (Creswell & Plano Clark, 2007). Both the qualitative and quantitative data are collected at the same time, so there is no need for more than one phase of research. As a result, selecting this design allowed for the rapid implementation of a second wave of data collection, something that would not have been possible if the exploratory design was re-used. In addition to the advantages of the concurrent triangulation design, Creswell and Plano Clark also highlight several challenges:

- More effort and expertise is required when compared to other mixed methods designs. This is because the qualitative and quantitative data are given equal weight in the data collection and analysis.
- When using data transformation, procedures need to be developed. It can be difficult to transform quantitative data into qualitative data.
- There can be problems when the qualitative and quantitative data provide contrasting results. If this occurs, more data collection may be required.

In regard to the first point, the amount of effort and expertise required to implement the revised design was not considered to be much greater than that in the original design. In both cases, large amounts of qualitative and quantitative data were required, leading to a similar amount of data collection and analysis. Therefore, this point was not considered to be a substantial limitation. Similarly, the point relating to data transformation was not considered to present a momentous challenge. Rather than facing the challenge of trying to recode quantitative data into qualitative, a large amount of qualitative data was collected and transformed into quantitative data by two research assistants. This process will be explained further in Chapter 10.

In contrast to the two previous points, the final challenge outlined by Creswell and Plano Clark (2007) was considered to be more of a liability. It was decided that, in the event that the qualitative and quantitative data yielded contrasting results, a fourth research phase would be required. Prior to the collection of data, the likelihood of this scenario occurring could not be completely prepared for; not an ideal situation when designing and planning research.
5.5. Data Analysis

In terms of quantitative data analysis, this was primarily performed using simple descriptive statistics. More sophisticated statistics, used in the latter stages of Phase 3, are explained in more detail in Chapter 10. All of the qualitative data collected for this thesis were analysed using thematic analysis. Thematic analysis is an uncomplicated form of qualitative analysis whereby data are “examined in order to identify relatively broad themes which summarise the content of the data” (Howitt, 2010, p.176). Due to the ease associated with performing thematic analyses, this technique has become popular among quantitatively trained psychologists. However, it has also been criticised for lacking a clear structure or set of rules (Braun & Clarke, 2006). Scholars on this subject have suggested that researchers adopting this form of qualitative data analysis should clearly demarcate the guiding criteria (i.e., Braun & Clarke, 2006; Howitt, 2010). For the purposes of this thesis, thematic coding was guided by five quality criteria suggested by Howitt (2010). These criteria are as follows:

- Ascertain that all responses are examined equally
- Themes should be generated from all provided responses, not just prominent examples
- All responses within a theme should be examined together
- Themes should be cross-checked
- Ensure that themes are consistent and coherent

Thematic analysis was used in all three phases of the research design. In Phase 1, coding was performed using factors of Internet Addiction measures, while in Phases 2 and 3, coding of participant responses took place. The thesis author performed all thematic analysis using the following procedure. Data were first examined, and broad themes were generated inductively. The responses (or factors) within these broad themes were then re-examined, and coding was refined, if necessary. This resulted in a final set of major themes. During the analysis of participant responses, the aforementioned process was repeated within each major theme in order to identify whether there were any apparent subthemes. Subthemes were included in the analysis when there was more than one other similar response. More information about the thematic analysis process for each phase is provided in the relevant chapters.
5.6. Summary

The aim of this chapter was to provide the rationale and descriptive overview of the methodology and research designs employed in this thesis. Previous research in the area of Internet Addiction has been inconsistent, and has led to conceptual chaos. Another form of behavioural addiction, Pathological Gambling, has been better accepted, perhaps in part due to the promotion of a set of diagnostic criteria in the DSM. In essence, the processes involved in the creation of the Pathological Gambling criteria inspired the design employed in this thesis.

In regards to the initial research design, an exploratory sequential mixed methods design was selected, as it allowed for research to be performed in the absence of any existing measures or solid theory. The design of the research incorporated three phases: a qualitative systematic review of Internet Addiction measures (Phase 1), a qualitative study of potential Facebook addicts (Phase 2), and a quantitative study of Facebook users in general (Phase 3). However, due to the fact that Phase 2 produced unexpected data, the original design for Phase 3 was reviewed. Instead, a revised research design for Phase 3 was created involving concurrent triangulation mixed methods. The reasoning behind this shift will be explained in greater detail in Chapters 7 and 8. In the next chapter, however, Phase 1 of the original research design – the systematic review - will be discussed.
Chapter 6
Phase 1: Systematic Review of Internet Addiction Measures

In the previous chapter, the initial research design of this thesis was described, including the three phases of data collection and analysis (see Figure 5.1). The present chapter provides more detail about Phase 1 of this research design: the systematic review and thematic analysis. The aim of the systematic review was to identify a set of predominant themes within existing measures of Internet Addiction. These themes, which were considered to represent the common symptoms of Internet Addiction, were then used to develop a series of open-ended questions in order to explore Facebook Addiction (this will be explained in further detail in Chapter 7). The methods used to conduct the systematic review and thematic analysis are presented in this chapter, along with a discussion of the results.

6.1. Method

The method used in Phase 1 of the research design incorporated three stages. The first two stages - the collection of data through an instrument identification search and an instrument detail search - made up the systematic review. The third stage was required for the purposes of data analysis, and involved conducting a thematic analysis. Further details about each of these three stages are presented in the sections below, beginning with the instrument identification search.

6.1.1. Instrument identification search. In late 2011, electronic searches of the ProQuest academic databases PsycINFO and PsycARTICLES were performed to identify existing instruments of Internet Addiction cited in the academic literature. Psychological databases were chosen as they were considered to be likely to return relevant results relating to Internet Addiction. The PsycINFO and PsycARTICLES databases were selected as they are amongst the most comprehensive databases in this discipline (APA, 2014). While PsycARTICLES only includes peer-reviewed journal articles, PsycINFO also includes books and dissertations. All three forms of literature were searched wherever possible.

There were three main types of literature identified to be of interest for the initial search: (a) those dealing with the development of Internet Addiction
instruments, (b) those examining the psychometric properties of existing Internet Addiction instruments, and (c) those measuring Internet Addiction using existing instruments. The following terms were used to search for these types of literature in both databases: Internet Addiction, compulsive Internet use, pathological Internet use, problematic Internet use, and Internet abuse. These search terms were also combined with the following additional terms: survey, questionnaire, measure, scale, and instrument.

Following the initial search described above, a secondary instrument identification search was performed to find a fourth type of paper: literature reviews. The rationale behind this search was related to the possibility that literature reviews might list additional Internet Addiction instruments not identified in the first search. To find these literature reviews, a title keyword search was performed using the following terms: Internet, addiction, compulsive, pathological, problematic, and abuse. The term review was also included as a title and/or abstract keyword.

To ensure that instruments identified through the literature search were appropriate and relevant, it was necessary to employ a filtering process. For example, instruments that were designed to measure Internet Addiction in specific populations, such as adolescents or children, were not deemed to be broad enough for inclusion. In a similar vein, instruments that were cultural adaptations of existing Western instruments were excluded, providing that the original English-based instrument had been previously identified. Diagnostic criteria were also excluded, as they are generally not subjected to factor analysis. As will become clear in Section 6.1.3, a lack of factor analysis rendered instruments unsuitable for thematic analysis. A formal list of the exclusion criteria are provided below:

- Documents that did not include or make mention of at least one Internet Addiction instrument
- Documents that were not written in English, unless the required information was available in an English abstract
- Documents in which an Internet Addiction instrument was used, but no name was provided for that instrument
- Documents focusing entirely on specific forms of Internet Addiction, such as online gambling or gaming
- Documents using only Internet Addiction instruments developed for specific populations (i.e., high school students)
• Documents whose full text version was unavailable in an online format (unless the name of the instrument could be obtained from the abstract)
• Documents that used diagnostic criteria as the main tool for measuring Internet Addiction
• Documents using Internet Addiction instruments that were non-English versions of an established English instrument.

6.1.2. Instrument detail search. Once the instrument identification search was complete, a follow-up search strategy was employed. This involved searching PsycINFO\textsuperscript{19} using the titles of each of the Internet Addiction instruments that had been identified through the first set of searches described in Section 6.1.1. The main aim of this search was to extract detailed information about each of the identified instruments; specifically, the factor structure, psychometric properties, and academic presence of each. In this context, academic presence refers to whether the measures had been used in peer-reviewed empirical studies on multiple occasions. This search took place in late 2011, and facilitated the decision-making process regarding which measures would be suitable for inclusion in the thematic analysis (see Section 6.1.3).

As with the instrument identification search, three main types of literature were of interest for the instrument detail search: (a) those dealing with the development of the Internet Addiction instrument in question, (b) those examining the psychometric properties of the Internet Addiction instrument in question, and (c) those measuring Internet Addiction using the Internet Addiction instrument in question. The exclusion criteria for literature found during the secondary search were similar to those listed above for the initial search, and were as follows:

• Documents that were not written in English, unless the required information was available in an English abstract
• Documents that had not performed a study using at least one of the identified Internet Addiction instruments
• Documents whose full text version was unavailable in an online format (unless the required information was available in the abstract)
• Documents using Internet Addiction instruments that were non-English versions of an established English instrument

\textsuperscript{19} The PsycARTICLES database was not used for the instrument detail search, as the overlap between search results from PsycINFO was high; only one unique article was found using PsycARTICLES in the instrument identification search.
6.1.3. Thematic analysis. Once Internet Addiction instruments had been identified using the above methods, the next step was to ascertain which were suitable for inclusion in the thematic analysis. There were three main criteria involved in making this decision. First, it was important that factor analysis had been performed on the instrument, and that the underlying factors had been identified during the instrument detail search. As already pointed out in Chapter 5, the most effective way to identify the core symptoms of Internet Addiction was considered to be grouping the common factors of Internet Addiction into overarching themes. In order to be considered common, it was required that a factor appeared in at least two separate measures. The inclusion of a factor in at least two measures demonstrates a degree of reliability for the factor in question. This stipulation was important, given the degree of conceptual confusion inherent in Internet Addiction research (see Chapter 2).

Second, it was required that the included measures had a satisfactory degree of academic presence. Instruments that had been used in at least three studies since their development were deemed to have academic presence, and were included in the thematic analysis. This technique was suggested to be an effective filtering strategy by Humphrey et al. (2011), as it indicates “that the measure has gone beyond basic development and validation and is being used by the academic community for program evaluation, theory development, and so on” (p. 625). While those authors established a cut-off of four, this was reduced to three in the present thesis. Given the predominance of the IAT and the YDQ (see Section 3.1), it was considered unlikely that many other measures would obtain an academic presence of four.

Third, it was necessary that measures had adequate psychometric properties, including evidence of both validity and reliability. Assessing the psychometric properties of measures is a technique frequently used within systematic reviews to determine the quality of instruments (e.g., Hales, Zimmerman, & Rodin, 2010; Harvey, Robin, Morris, Graham, & Baker, 2008; Humphrey et al., 2011). Excluding measures that have either not been subjected to psychometric testing, or that have not reached adequate levels of psychometric testing (i.e., Cronbach’s alpha of <.60), ensures that the measures that are included in the systematic review are of the highest possible quality. This is important in a field such as Internet Addiction, where there are many available measures to choose from.

In order to conduct the thematic analysis, factors from each of the included
instruments were pooled and then classified into categories based on the similarity of their themes. The process of conducting the thematic analysis was straightforward, as all of the included measures had been subjected to factor analysis. Due to this, inter-rater coding was not used. The thematic analysis was conducted inductively, meaning that there were no a priori themes identified (Skirton, O’Connor, & Humphreys, 2012). Factors that were conceptually similar were grouped together and given appropriate titles. In cases where a particular factor appeared to fit equally within two different themes, it was included in both.

6.2. Results and Discussion

Figure 6.1 provides a general overview of the process and results from the three stages of Phase 1. Results and discussion relating to each of the three stages are presented in the subsections below. In order to enhance clarity and avoid repetition, the results and discussion sections have been combined.

6.2.1. Instrument identification search. The initial instrument identification search yielded 1281 documents, which were primarily peer-reviewed journal articles describing empirical studies. When the exclusion criteria were applied, only 126 documents were retained. A secondary search for literature reviews yielded an additional 86 documents. After the application of the exclusion criteria, ten literature reviews were retained. Therefore, a total of 136 documents were included in the systematic review. Table 6.1 provides the name of each identified instrument, as well as details of each of the sources for each instrument.

As shown in Table 6.1, the systematic review identified 30 distinct measures of Internet Addiction. This number is higher than the results of a recently published systematic review of Internet Addiction measures (Kuss et al., 2014), which included 21 measures. Unlike the present systematic review, those authors chose to include diagnostic criteria, such as the YDQ. Kuss et al. also included measures designed specifically for adolescents, while these were excluded in the present review. In another recent review, Lortie and Guitton (2013) identified 30 distinct measures prior to filtering. This result is the same as the present review, although those authors included measures of online gaming addiction.

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20 In the final tally of measures, the Chinese Internet Addiction Scale – Revised (Wang, 2006) and the Modified Internet Addiction Scale (DeLonga et al. 2011) were counted as the CIAS and IAS, respectively.
Table 6.1

*Results of Internet Addiction Instrument Identification Search, Including Details of Sources*

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Author(s)</th>
<th>Year</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chen/Chinese Internet Addiction Scale</td>
<td>Chen et al.</td>
<td>2003</td>
<td>Chinese Journal of Psychology</td>
</tr>
<tr>
<td></td>
<td>Wu &amp; Li</td>
<td>2005</td>
<td>Chinese Mental Health Journal</td>
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<tr>
<td></td>
<td>Chou, Condron &amp; Belland</td>
<td>2005</td>
<td>Educational Psychology Review</td>
</tr>
<tr>
<td></td>
<td>Li &amp; Chung</td>
<td>2006</td>
<td>Computers in Human Behavior</td>
</tr>
<tr>
<td></td>
<td>Ko, Yen, Chen, Chen, Wu &amp; Yen</td>
<td>2006</td>
<td>The Canadian Journal of Psychiatry</td>
</tr>
<tr>
<td></td>
<td>Wu &amp; Cheng</td>
<td>2007</td>
<td>CyberPsychology &amp; Behavior</td>
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<tr>
<td></td>
<td>Yen, Yen, Chen, Chen &amp; Ko</td>
<td>2007</td>
<td>CyberPsychology &amp; Behavior</td>
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<tr>
<td></td>
<td>Yen, Ko, Yen, Wu &amp; Yang</td>
<td>2007</td>
<td>Journal of Adolescent Health</td>
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<td>Psychiatria Hungarica</td>
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<tr>
<td>Demetrovics, Szeredi &amp; Rózsa</td>
<td>2008</td>
<td></td>
<td>Behavior Research Methods</td>
</tr>
<tr>
<td>Jia &amp; Jia</td>
<td>2009</td>
<td></td>
<td>Computers in Human Behavior</td>
</tr>
<tr>
<td>Kelley &amp; Gruber</td>
<td>2010</td>
<td></td>
<td>Computers in Human Behavior</td>
</tr>
<tr>
<td>Problematic Internet Use Questionnaire&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Thatcher &amp; Goolam</td>
<td>2005</td>
<td>South African Journal of Psychology</td>
</tr>
<tr>
<td>Thatcher, Wretschko &amp; Fisher</td>
<td>2008</td>
<td></td>
<td>CyberPsychology &amp; Behavior</td>
</tr>
<tr>
<td>Thatcher, Wretschko &amp; Fridjhon</td>
<td>2008</td>
<td></td>
<td>Computers in Human Behavior</td>
</tr>
<tr>
<td>Problematic Internet Usage Scale</td>
<td>Jia &amp; Jia</td>
<td>2009</td>
<td>Computers in Human Behavior</td>
</tr>
<tr>
<td>The Use, Abuse and Dependence on the Internet Inventory</td>
<td>Gnisci, Perugini, Pedone &amp; Conza</td>
<td>2011</td>
<td>Computers in Human Behavior</td>
</tr>
<tr>
<td>Virtual Addiction Survey</td>
<td>Widyanto &amp; Griffiths</td>
<td>2006</td>
<td>International Journal of Mental Health and Addiction</td>
</tr>
</tbody>
</table>

<sup>a</sup>This instrument was developed by Demetrovics et al. (2008).
<sup>b</sup>This instrument was developed by Thatcher and Goolam (2005).
As both previous reviews (Kuss et al., 2014; Lortie & Guitton, 2013) had more lenient inclusion criteria for instruments than the present review, it is surprising that their list of included instruments was similar or less to those reported here. However, this may reflect the fact that the literature searches in both reviews employed stricter inclusion criteria. For example, Kuss et al. chose to limit their search to epidemiological studies of Internet Addiction published after 2000 and those with a sample size greater than 1000. Lortie and Guitton, on the other hand, only included literature if it mentioned the name of the instrument in the abstract. Both of these approaches would have limited the yield of Internet Addiction instruments in comparison to the methods used here.

6.2.2. Instrument detail search. The names of 30 measures of Internet Addiction from Table 6.1 were entered into the PsycINFO database to assess their factor structures, psychometric properties, and academic presence. This process yielded 163 journal articles and dissertations that had conducted empirical research studies using at least one of the identified measures. These data are provided in Table 6.2. It should be noted that six instruments are not included in this table as full-text versions of the documents were unavailable and the required information was not provided in abstracts: the Internet Addiction Disorder Questionnaire (IADQ; Nannan & Haigen, 2005), the IRABI (Brenner, 1997), the Virtual Addiction Survey (VAS; Greenfield, 1999), the Internet Addiction Disorder Test (IADT; Unknown), the Internet Addiction Impairment Index (IAII; Unknown), the Internet Addiction Questionnaire (IAQ; Unknown).

In Chapter 2, the point was made that early measures of Internet Addiction, such as the IAT (Young, 1998), were based upon diagnostic criteria from existing addictive disorders. In general, the developers of these measures also included several extra items, which they considered to be related to Internet Addiction. Unfortunately, an explanation regarding the selection of these items was often not provided by the developers of the instruments (i.e., Brenner, 1997; Young, 1998). As argued by Griffiths (1999), this casts a degree of doubt over the relevance of these extra items. Throughout the process of the systematic review, information about the item development of each measure was collected (see Table 6.2). Therefore, it is now possible to examine this information in more detail, to ascertain whether there has been improvement in this regard.

Crocker and Algina (2008) provide a list of methods by which instrument items can be developed. These include reviewing previous research, analysing qualitative
Table 6.2

Results of Internet Addiction Instrument Detail Search

<table>
<thead>
<tr>
<th>Name of Instrument</th>
<th>Author(s), Year</th>
<th>Item Development</th>
<th>Items</th>
<th>Sample</th>
<th>Psychometrics</th>
<th>Factors/Dimensions</th>
<th>Academic Presence</th>
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</thead>
<tbody>
<tr>
<td>Internet Addiction Test&lt;sup&gt;a&lt;/sup&gt; (IAT)</td>
<td>Young, 1998</td>
<td>Based on the DSM-IV criteria for Pathological Gambling, and behavioural indicators that distinguished Internet addicts from non-Internet addicts.</td>
<td>20</td>
<td>Convenience sample of 410 undergraduate students from 8 Hong Kong universities</td>
<td>Reliability: Internal consistency is adequate for Factor 1 (.89) and 2 (.87), but low for Factor 3 (.60). Validity: Convergent and discriminant validity was evident between factors.</td>
<td>1. Withdrawal and Social Problems, 2. Time Management and Performance Effects, 3. Reality Substitution</td>
<td>65 results</td>
</tr>
<tr>
<td>Chinese/Chen Internet Addiction Scale (CIAS)</td>
<td>Chen et al. 2003</td>
<td>Focused interviews and diagnostic criteria of other well-defined addiction disorders</td>
<td>26</td>
<td>Random sample of 1336 Taiwanese university students. More detailed information is not available as the original article is written in Chinese.</td>
<td>Detailed psychometric information is not available as the original article is written in Chinese. The abstract includes the following information: “the CIAS is an appealing and reliable test with satisfactory test-retest reliability and internal consistency”. No validity information is available.</td>
<td>1. Tolerance, 2. Withdrawal, 3. Compulsive use, 4. Time management problem, 5. Interpersonal and health problems.</td>
<td>31 results</td>
</tr>
<tr>
<td>Name of Instrument</td>
<td>Author(s), Year</td>
<td>Item Development</td>
<td>Items</td>
<td>Sample</td>
<td>Psychometrics</td>
<td>Factors/Dimensions</td>
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<tr>
<td>Online Cognitions Scale (OCS)</td>
<td>Davis et al., 2002</td>
<td>Adapted from Davis theory, and similar measures of procrastination, depression, impulsivity, and Pathological Gambling. Also informed by symptoms described in the literature, with a specific focus on cognitions rather than behaviours.</td>
<td>36</td>
<td>Convenience sample of 211 undergraduate psychology students from Canada</td>
<td>Reliability: High internal consistency as a total measure (.94), and for each of the factors (.77-.87) Highly significant item-total correlations.</td>
<td>1. Diminished Impulse Control, 2. Social Comfort, 3. Loneliness/Depression, 4. Distraction</td>
<td>16 results</td>
</tr>
<tr>
<td>Generalized Problematic Internet Use Scale (GPIUS)</td>
<td>Caplan, 2002</td>
<td>Items developed from examples of generalized PIU and theories provided by Davis (2001). Also based on conceptually similar items from other Internet Addiction measures.</td>
<td>29</td>
<td>Convenience sample of 386 undergraduate students from the USA.</td>
<td>Reliability: High internal consistency for the seven factors (.78 -.85)</td>
<td>1. Mood Alteration, 2. Social Benefits, 3. Negative Outcomes, 4. Compulsive Use, 5. Excessive Time Online, 6. Withdrawal, 7. Social Control</td>
<td>12 results</td>
</tr>
<tr>
<td>Name of Instrument</td>
<td>Author(s), Year</td>
<td>Item Development</td>
<td>Items</td>
<td>Sample</td>
<td>Psychometrics</td>
<td>Factors/Dimensions</td>
<td>Academic Presence</td>
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<tr>
<td>Compulsive Internet Use Scale (CIUS)</td>
<td>Meerkerk et al., 2009</td>
<td>Based on DSM-IV dependence and Pathological Gambling criteria as well as criteria for behavioural addictions proposed by Griffiths (1999)</td>
<td>14</td>
<td>Initial study: 447 heavy internet users. Later study: Convenience sample of 16,925 regular Internet users (skewed sample with 70% younger than 22 and 77.4% male).</td>
<td>Reliability: Initial study resulted in a Cronbach's alpha of 0.89. Later study showed a Cronbach's alpha of 0.90. Validity: Initial study showed construct validity with OCS ($r = 0.70$) and with time spent on Internet ($r = 0.33$). A later study demonstrated evidence of construct validity with time spent online ($r = 0.42$), participants experience of problem Internet use ($r = 0.45$) and participants feeling addicted to the Internet ($r = 0.52$).</td>
<td>Single factor</td>
<td>7 results</td>
</tr>
<tr>
<td>Pathological Internet Use Scale (PIUS)</td>
<td>Morahan-Martin &amp; Schumacher, 2000</td>
<td>Not supplied</td>
<td>13</td>
<td>277 undergraduate Internet users</td>
<td>Reliability: The scale had high internal reliability. The standardised item alpha was 0.88. Validity: No evidence of validity was provided.</td>
<td>No evidence of factor analysis. The authors classify the items as measuring academic, work, or interpersonal problems, personal distress, withdrawal symptoms, and mood-altering use.</td>
<td>5 results</td>
</tr>
<tr>
<td>Name of Instrument</td>
<td>Author(s), Year</td>
<td>Item Development</td>
<td>Items</td>
<td>Sample</td>
<td>Psychometrics</td>
<td>Factors/Dimensions</td>
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<tr>
<td>Internet Related Problem Scale (IRPS)²</td>
<td>Armstrong et al., 2000</td>
<td>Based on the DSM-IV criteria for substance abuse</td>
<td>20</td>
<td>A non-clinical sample of 225 Internet users recruited from an existing database of research participants</td>
<td>Reliability: Internal consistency was high for Factor 1 (.90) and Factor 2 (.86), but low for Factor 3 (.64) and Factor 4 (.60). Validity: Overall scale displays good convergent validity with the overall IAT and self-diagnosis of Internet Addiction. No evidence of discriminant validity.</td>
<td>1. Negative Effects, 2. Mood Modification, 3. Loss of Control, 4. Increased Use</td>
<td>5 results</td>
</tr>
<tr>
<td>Problematic Internet Use Scale (PIUS)</td>
<td>Ceyhan et al., 2007</td>
<td>Expert opinions and suggestions</td>
<td>33</td>
<td>1658 Turkish university students</td>
<td>Reliability: Good internal consistency for the total scale (.94). Adequate test-retest reliability (.81) and split half reliability (0.83). Validity: Less than adequate convergent and divergent validity.</td>
<td>1. Negative Consequences of the Internet, 2. Social Benefits/Social Comfort, 3. Excessive Use</td>
<td>5 results</td>
</tr>
<tr>
<td>Problematic Internet Use Questionnaire (PIUQ)</td>
<td>Thatcher &amp; Goolam, 2005</td>
<td>Based on a Pathological Gambling questionnaire (The South Oaks Gambling Screen), other comparable research studies regarding symptoms of Internet overuse, and Young's Diagnostic Criteria.</td>
<td>20</td>
<td>Pilot study of 279 participants plus a validation study using 1795 participants. Participants were recruited from an online IT magazine</td>
<td>The full text version of Thatcher &amp; Goolam (2005) was not available, but the abstract reveals that the PIUQ has good reliability and validity. Each of the subscales is also reported to have good reliability.</td>
<td>1. Online preoccupation, 2. Adverse effects, 3. Social interactions</td>
<td>3 results</td>
</tr>
<tr>
<td>Name of Instrument</td>
<td>Author(s), Year</td>
<td>Item Development</td>
<td>Items</td>
<td>Sample</td>
<td>Psychometrics</td>
<td>Factors/Dimensions</td>
<td>Academic Presence</td>
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<tr>
<td>Problematic Internet Use Questionnaire&lt;sup&gt;c&lt;/sup&gt; (PIUQ)</td>
<td>Demetrovics, et al. 2008</td>
<td>Modified the items of the IAT and added additional questions based on symptoms described in the Internet Addiction literature</td>
<td>18</td>
<td>278 undergraduate psychology students from two universities in USA</td>
<td>Reliability: Reliability for the total scale was .91, and ranged from .77 to .81 for the subscales. Adequate item-total correlations. Validity: Strong evidence for convergent and divergent validity.</td>
<td>1. Obsession, 2. Neglect, 3. Control Disorder</td>
<td>3 results</td>
</tr>
<tr>
<td>Internet Addiction Scale (IAS)</td>
<td>Nichols &amp; Nicki, 2004</td>
<td>Based on the seven DSM-IV substance dependence criteria and two additional criteria recommended by Griffiths (1998). Further development was assisted through informal interviews with five volunteer student Internet users, as well as using items from existing measures. A focus group of six volunteer psychology graduate students also gave feedback.</td>
<td>31</td>
<td>207 undergraduate students from the University of New Brunswick in Canada</td>
<td>Reliability: Cronbach’s alpha = .95. Validity: Significant correlations with Family and Social Loneliness and Boredom proneness.</td>
<td>Single factor</td>
<td>2 results</td>
</tr>
<tr>
<td>Different Types of Internet Addiction Scale (DTIAS)</td>
<td>Zhou &amp; Yang, 2006</td>
<td>Based on interviews and open questionnaires</td>
<td>Unknown</td>
<td>733 Chinese college students, retest sample of 91 subjects.</td>
<td>The full-text version of Zhou &amp; Yang (2006) was not available, but the abstract reveals that test-retest reliability, split-half reliability, internal consistency reliability, and construct validity were examined.</td>
<td>No evidence of factor analysis from abstract</td>
<td>2 results</td>
</tr>
<tr>
<td>Name of Instrument</td>
<td>Author(s), Year</td>
<td>Item Development</td>
<td>Items</td>
<td>Sample</td>
<td>Psychometrics</td>
<td>Factors/Dimensions</td>
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<tr>
<td>Internet Over-use Scale (IOS)</td>
<td>Jenaro et al., 2007</td>
<td>Based on seven of the 10 Pathological Gambling criteria from the DSM-IV (Criteria 6, 8, 10 not included).</td>
<td>23</td>
<td>337 Spanish college students.</td>
<td>Not provided</td>
<td>Not performed</td>
<td>1 result</td>
</tr>
<tr>
<td>Generalized Problematic Internet Use Scale 2 (GPIUS2)</td>
<td>Caplan, 2010</td>
<td>Same as GPIUS, but revised to include items based on research by Caplan 2003 and others.</td>
<td>15</td>
<td>424 undergraduate communications students from USA</td>
<td>Reliability: Internal consistency was good for the individual subscales (.82 - .87) and the overall measure (.91). Validity: Adequate construct validity for the overall measure. Demonstrated convergent and divergent validity among subscales.</td>
<td>1. Preference for Online Social Interaction, 2. Mood Regulation, 3. Deficient Self-Regulation (Compulsive Use and Cognitive Preoccupation), 4. Negative Outcomes</td>
<td>1 result</td>
</tr>
<tr>
<td>Chinese Internet Addiction Inventory (CIAI)</td>
<td>Huang et al., 2007</td>
<td>All 20 of Young's items were included plus another 22 items were generated from clinical work and interviews.</td>
<td>31</td>
<td>First sample: 1029 Chinese undergraduate students from 14 universities and colleges. Second sample: 513 individuals between 17 and 24.</td>
<td>Reliability: First sample: Test-retest reliability is acceptable (.65-.75). Second sample: alpha reliabilities of .80-.90. Validity: The 3-factor structure was cross-validated using CFA, implying good construct validity.</td>
<td>Conflicts (negative consequences, salience, and relapse), mood modification, and dependence (tolerance, preoccupation, and withdrawal).</td>
<td>1 result</td>
</tr>
<tr>
<td>Name of Instrument</td>
<td>Author(s), Year</td>
<td>Item Development</td>
<td>Items</td>
<td>Sample</td>
<td>Psychometrics</td>
<td>Factors/Dimensions</td>
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<tr>
<td>The Use, Abuse and Dependence on the Internet Inventory (UADI)</td>
<td>Del Miglio, Gamba, Cantelmi, 2001</td>
<td>Unknown (original article written in Italian)</td>
<td>80</td>
<td>Psychometrics tested by Gnisci et al (2011) on a sample of 820 high school and 236 university students in Italy</td>
<td>Reliability: Internal consistency of factors: .80 -.87. The two factor scales were not correlated with each other. Validity: Dependence scale was associated with other measures of PIU, but Real Life Impact was not.</td>
<td>Real Life Impact and Dependence (dissociation, experience making, addiction compulsion, evaluation)</td>
<td>1 result</td>
</tr>
<tr>
<td>Deficient Internet Self Regulation Scale (DISRS)</td>
<td>LaRose et al., 2003</td>
<td>Based on operational definitions of Internet Addiction used in prior research (Greenfield 1999; Griffiths, 1999; Rozin &amp; Stoess, 1993; Young, 1999)</td>
<td>7</td>
<td>Purposive sample of 498 students in three introductory communication classes at two Midwestern American universities.</td>
<td>Reliability: Cronbach's alpha = .86. Validity: Not provided</td>
<td>Deficient Internet Self-Regulation</td>
<td>0 results</td>
</tr>
<tr>
<td>Internet Use Measurement (IUM)</td>
<td>Mueller et al, 2011</td>
<td>Not specified</td>
<td>8</td>
<td>387 people with ages ranging between 18 and 74 were recruited through newspaper, web site postings and flyers.</td>
<td>Reliability: The coefficient alpha value was .93 Validity: Not provided</td>
<td>Not performed</td>
<td>0 results</td>
</tr>
<tr>
<td>Index of Problematic Online Experiences (I-POE)</td>
<td>Mitchell et al., 2009</td>
<td>Based in part on Davis's cognitive-behavioural model of generalised pathological Internet use and designed in content from the Inventory of Problematic Online Experiences. The I-</td>
<td>26</td>
<td>563 undergraduate students from a Northern New England public university</td>
<td>Reliability: Not provided. Validity: Construct validity was found; total I-POE score correlated with depression, anger/irritability, sexual concerns, dysfunctional sexual behaviour and tension reduction behaviour, permissive attitudes towards</td>
<td>Not performed</td>
<td>0 results</td>
</tr>
<tr>
<td>Name of Instrument</td>
<td>Author(s), Year</td>
<td>Item Development</td>
<td>Items</td>
<td>Sample</td>
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<tr>
<td>Computer and Internet Use Questionnaire</td>
<td>Mullis et al., 2007</td>
<td>Based on previous research</td>
<td>16</td>
<td>156 undergraduate female students enrolled in basic studies courses at a large south-eastern university</td>
<td>Not specified</td>
<td>Quantity of computer and internet use, types of computer and internet use</td>
<td>0 results</td>
</tr>
<tr>
<td>Internet Usage Questionnaire (IUQ)</td>
<td>Fortson et al., 2007</td>
<td>Based on the DSM-IV criteria for substance abuse and dependency.</td>
<td>17</td>
<td>485 undergraduate students enrolled in an introductory psychology course at a large university in the southeast of America.</td>
<td>Reliability: Cronbach's alpha = .62</td>
<td>Not specified</td>
<td>0 results</td>
</tr>
<tr>
<td>Impairment Index from the Internet Use Survey (II-IUS)</td>
<td>Rotunda et al., 2003</td>
<td>Included several items from DSM-IV criteria for Pathological Gambling and substance use dependence</td>
<td>32</td>
<td>393 students from an America University in a small south-eastern urban area. Primarily recruited from upper-level courses in computer science and psychology.</td>
<td>Reliability: Coefficient alpha = .73. Internal consistency of factors: Absorption = .90, Negative Consequences = .85, Sleep = .73, Deception = .65.</td>
<td>1. Absorption, 2. Negative Consequences, 3. Sleep, 4. Deception</td>
<td>0 results</td>
</tr>
<tr>
<td>Name of Instrument</td>
<td>Author(s), Year</td>
<td>Item Development</td>
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<td>Sample</td>
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<tr>
<td>Internet Effects Questionnaire (IEQ)</td>
<td>Campbell et al., 2006</td>
<td>Information not provided</td>
<td>18</td>
<td>188 self-selected Internet users and 27 Australian undergraduate students</td>
<td>Not provided</td>
<td>None provided</td>
<td>0 results</td>
</tr>
<tr>
<td>Internet Addiction Tendency Scale® (IATS)</td>
<td>Song et al., 2004</td>
<td>Based on existing Internet Addiction measures (the IAT and the PIUS) and literature.</td>
<td>6</td>
<td>498 undergraduate communications students from Midwestern USA</td>
<td>Reliability: Not provided</td>
<td>None provided</td>
<td>0 results</td>
</tr>
</tbody>
</table>

Note. Table adapted from “Measures of Social and Emotional Skills for Children and Young People: A Systematic Review” by N. Humphrey et al., 2011, *Educational and Psychological Measurement*, 71, p. 626. Copyright 2011 by Sage Publications. Information about sample, psychometrics and factors were taken from Chang and Law, 2008. Information about factors, psychometrics, and sample were taken from Widyanto et al., 2001. Information about factors, psychometrics, and sample were taken from Kelley and Gruber, 2010. Information about factors and psychometrics were taken from Gnisci et al., 2011.
data relating to the construct, gathering expert opinion, creating a list of extreme behaviours, and observing the construct directly. Of the 30 measures identified in the present systematic review, information relating to item development was provided for only 20 (see Table 6.2). If this information is analysed, it is apparent that developers of the included Internet Addiction measures used only the first three of Crocker and Algina’s methods. These methods will now be discussed in further detail.

Drawing on previous research was the most commonly cited method of developing items for Internet Addiction measures. In fact, Table 6.2 illustrates that 18 out of 20 instrument developers used this method. Within this method, it was possible to identify four distinct approaches: (a) borrowing from diagnostic criteria or measures of other addictive disorders, (b) borrowing from existing measures of Internet Addiction, (c) gathering information from relevant academic literature on Internet Addiction, and (d) creating items based on Internet Addiction theory.

Given the genesis of Internet Addiction measurement, it is unsurprising that the most commonly cited method of developing an instrument of Internet Addiction was by borrowing criteria or instrument items from other disorders. In fact, a total of 10 out of 20 measures were developed in this way. Four of these measures were based on Pathological Gambling criteria or items (Davis et al., 2002; Jenaro et al., 2007; Thatcher & Goolam, 2005; Young, 1998), three were based on substance-related disorder criteria (Armstrong et al., 2000; Fortson et al., 2007; Nichols & Nicki, 2004), and three were based on both Pathological Gambling and substance-related disorder criteria (Chen et al., 2003; Meerkerk et al., 2009; Rotunda et al., 2003). Two measures also included at least one of Griffiths’ behavioural addiction criteria (Meerkerk et al., 2009; Nichols & Nicki, 2004), and one drew additional items from measures of procrastination, depression and impulsivity (Davis et al., 2002).

As briefly mentioned in Chapter 2, the approach of developing measures by borrowing items from non-Internet-related addictive disorders has been the subject of criticism. Several authors have questioned the relevance of criteria from other forms of addiction when used to measure Internet Addiction. For example, Shaffer et al. (2000) raise the point that assuming Pathological Gambling and Internet Addiction are similar in every way is making a large theoretical and conceptual leap. Furthermore, Grohol argues:

“Pathological Gambling [is] a single, anti-social behaviour that has little social redeeming value. Researchers in this area believe they can simply copy this criteria and apply it to hundreds of behaviours carried out every day on the Internet, a largely pro-social, interactive,
and information-driven medium. Do these two areas have much in common beyond their face value? I don’t see it.” (1999, 27 May, para. 13)

With these objections in mind, it could be argued that measures developed entirely by borrowing items from the criteria of other disorders may fail to take into account unique aspects of Internet Addiction. Thus, it could be argued that the four measures that were developed entirely in this way - the CIUS (Meerkerk et al., 2009), the IRPS (Armstrong et al., 2000), the IOS (Jenaro et al., 2007), and the II-IUS (Rotunda et al., 2003) all lack construct validity.

In regard to borrowing items from existing Internet Addiction measures, six instrument developers took this approach (Caplan, 2002; Caplan, 2010; Demetrovics et al., 2008; Huang et al., 2007; Song et al., 2004; Thatcher & Goolam, 2005). This method of item development seems more logical than borrowing from non-Internet-related addictive disorders, but there are also issues with this approach. First, instrument developers often do not provide a strong rationale for why they chose to borrow from a particular measure or measures. As can be seen in Table 6.2, both the YDQ and the IAT (Young 1996; 1998) were used to develop measures such as the PIUQ21 (Demotrovics et al., 2008; Thatcher & Goolam, 2005), the CIAI (Huang et al., 2007), and the IATS (Song et al., 2004). Given the issues associated with the YDQ and the IAT (as detailed in Chapter 2), it is possible that their selection was influenced more heavily by the popularity of the measures rather than psychometrics. Second, it is common for researchers to fail to provide information or justifications regarding the selection process for borrowing particular scale items (i.e., Caplan, 2002; 2010). By leaving out this information, it is difficult to gain a sense of the relevance of the items included in the measure. Coupled with the lack of detailed psychometric testing, this creates the perception of an ad hoc item development process, which is less than ideal.

Seven measures were influenced by existing academic literature on the subject (Caplan, 2010; Davis et al., 2002; Demetrovics et al., 2008; LaRose et al., 2003; Mullis et al., 2007; Song et al., 2004; Thatcher & Goolam, 2005), and four were based on Internet Addiction theory (Caplan, 2002; Caplan, 2010; Davis et al., 2002; Mitchell et al., 2009). When existing academic literature has been used to develop items, there is again a sense of vagueness about which items were derived in this way. Reporting this information would increase the ability for other researchers to evaluate the usefulness of these measures. In regards to the use of theory as a

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21 There are two separate measures called the PIUQ, but both were based on Young’s work.
basis, this is perhaps one of the strongest approaches to the development of items based on previous research. However, the fact that only four measures were developed in this way points to the overwhelming absence of a theoretical framework underlying the measurement of this condition. As mentioned previously, this is an area that future researchers should endeavour to address.

Overall, drawing on previous research to develop Internet Addiction items appears to be a common approach. However, as Crocker and Algina (2008) point out, there are many other potential methods that can also be used in addition to this. As stated above, only two other methods appear to have been used by Internet Addiction researchers: qualitative evidence from Internet addicts and expert opinion. Of the measures where information about item development was available, six were influenced by qualitative evidence from Internet addicts (Caplan, 2002; Caplan 2010; Chen et al., 2003; Huang et al., 2007; Young, 1998; Zhou & Yang, 2006) and three were developed using expert opinion (Ceyhan et al., 2007; Mitchell et al., 2009; Nichols & Nicki, 2004). Both of these methods of item development are useful alternatives to relying exclusively on previous research. However, as stated in the Pathological Gambling example described in Section 5.2.1, developing items based on expert opinions or qualitative observations of particular samples of individuals can limit the reliability of measures. This is of particular concern when the measures in question have not been subjected to rigorous follow-up testing.

Each of the methods used by researchers to create items for Internet Addiction have their strengths and weaknesses. Given this situation, it is possible that a combination of methods may lead to a more valid and reliable measure. This is the same argument put forward in Section 2.3 in relation to Internet Addiction diagnostic criteria. Of the measures identified in Table 6.2, only six used a combination of methods (Caplan, 2002; Caplan, 2010; Chen et al., 2003; Huang et al., 2007; Nichols & Nicki, 2004; Young, 1998). However, none of these measures used a combination of more than two of Cocker and Algina’s (2008) methods. Again, this is something that should be addressed by researchers in the future. Furthermore, developing items through the identification of extreme behaviours and direct observation may also enhance construct validity.

Aside from matters associated with item development, it is also worth pointing out that of the 24 measures listed in Table 6.2, only six met inclusion criteria relating to academic presence and psychometric properties; the IAT (Young, 1998), the OCS (Davis et al., 2002), the GPIUS (Caplan, 2002), the IRPS (Armstrong et al., 2000),
and both versions of the PIUQ (Demetrovics et al., 2008; Thatcher & Goolam, 2005). Eleven measures were excluded on the basis that psychometric information was inadequate or unavailable (Campbell et al., 2006; Ceyhan et al., 2007; Chen et al., 2003; Fortson et al., 2007; Jenaro et al., 2007; LaRose et al., 2003; Mitchell et al., 2009; Mueller et al., 2011; Mullis et al., 2007; Rotunda et al., 2003; Song et al., 2004) and 16 were excluded on the basis of low academic presence (see Table 6.2).

The above findings suggest that, while there are a large number of Internet Addiction measures in existence, few have both gained acceptance by the research community and demonstrated adequate psychometric properties. This implies that researchers should give greater consideration to the instruments that they select when measuring Internet Addiction. In fact, further research surrounding test development and validation is recommended.

### 6.2.3. Thematic analysis.

The information provided in Table 6.2 determined which instruments were included in the thematic analysis. As summarised in Figure 6.1, only six met the inclusion criteria stipulated in Section 6.1.3. Table 6.3 presents the factors identified in the six instruments, as well as the themes that were ascribed in the thematic analysis. Initially, ten themes were identified: negative consequences, loss of control, online social enhancement, preoccupation, mood alteration, withdrawal, excessive use, reality substitution, distraction, and tolerance. However, consistent with the a priori guidelines established for this thematic analysis, reality substitution, distraction, and tolerance were excluded as they were not present in at least two measures.

Out of the seven remaining themes, the strongest was negative consequences, which appeared in the factor structures of five out of seven instruments. This broad theme relates to the propensity for Internet Addiction to lead to undesirable outcomes in the lives of individuals. Items measuring these consequences vary substantially in the included instruments, ranging from problems with interpersonal relationships, difficulties with employment or education, or neglect of personal hygiene or important daily tasks. The second most prominent theme was loss of control, which was represented by factors from four out of six measures. This theme taps into use of the Internet that has gone beyond the control of the user, to the point where it could be considered compulsive. Three of out six measures included factors relating to online social enhancement, preoccupation, and mood alteration. Online social interaction relates to the feeling of increased social
Table 6.3

Themes Ascribed to Factors Within Internet Addiction Measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>Factors</th>
<th>Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet Addiction Test</td>
<td>Withdrawal and Social Problems</td>
<td>Withdrawal/Negative</td>
</tr>
<tr>
<td></td>
<td>Time Management and</td>
<td>Excessive use/Negative</td>
</tr>
<tr>
<td></td>
<td>Performance Effects</td>
<td>consequences</td>
</tr>
<tr>
<td></td>
<td>Reality Substitution</td>
<td>Reality substitution</td>
</tr>
<tr>
<td>Online Cognitions Scale</td>
<td>Diminished Impulse Control</td>
<td>Loss of control</td>
</tr>
<tr>
<td></td>
<td>Social Comfort</td>
<td>Online social enhancement</td>
</tr>
<tr>
<td></td>
<td>Loneliness/Depression</td>
<td>Mood alteration</td>
</tr>
<tr>
<td></td>
<td>Distraction</td>
<td>Distraction</td>
</tr>
<tr>
<td>Generalized Problematic Internet Use Scale</td>
<td>Mood Alteration</td>
<td>Mood alteration</td>
</tr>
<tr>
<td></td>
<td>Social Benefits</td>
<td>Online social enhancement</td>
</tr>
<tr>
<td></td>
<td>Negative Outcomes</td>
<td>Negative consequences</td>
</tr>
<tr>
<td></td>
<td>Compulsive Use</td>
<td>Loss of control</td>
</tr>
<tr>
<td></td>
<td>Excessive Time Online</td>
<td>Excessive use</td>
</tr>
<tr>
<td></td>
<td>Withdrawal</td>
<td>Withdrawal</td>
</tr>
<tr>
<td></td>
<td>Social Control</td>
<td>Online social enhancement</td>
</tr>
<tr>
<td>Internet Related Problems Scale</td>
<td>Negative Effects</td>
<td>Negative consequences</td>
</tr>
<tr>
<td></td>
<td>Mood Modification</td>
<td>Mood alteration</td>
</tr>
<tr>
<td></td>
<td>Loss of Control</td>
<td>Loss of control</td>
</tr>
<tr>
<td></td>
<td>Increased Use</td>
<td>Tolerance</td>
</tr>
<tr>
<td>Problematic Internet Use Questionnaire&lt;sup&gt;d&lt;/sup&gt;</td>
<td>Online Preoccupation</td>
<td>Preoccupation</td>
</tr>
<tr>
<td></td>
<td>Adverse Effects</td>
<td>Negative consequences</td>
</tr>
<tr>
<td></td>
<td>Social Interactions</td>
<td>Online social enhancement</td>
</tr>
<tr>
<td>Problematic Internet Use Questionnaire&lt;sup&gt;+&lt;/sup&gt;</td>
<td>Obsession</td>
<td>Preoccupation</td>
</tr>
<tr>
<td></td>
<td>Neglect</td>
<td>Negative consequences</td>
</tr>
<tr>
<td></td>
<td>Control Disorder</td>
<td>Loss of control</td>
</tr>
</tbody>
</table>

<sup>a</sup> These themes were excluded as they only comprised single factors. <sup>b</sup>This instrument was developed by Thatcher and Goolam (2005). <sup>c</sup>This instrument was developed by Demetrovics et al. (2008).

connectedness and confidence that Internet-based communication provides for some individuals. Preoccupation is said to occur when individuals think about the Internet obsessively when they are not using it, while mood alteration describes use of the Internet to escape from unpleasant and unwanted mood states. The two least prominent themes were withdrawal and excessive use, which were represented by factors from only two measures each. Withdrawal relates to the unpleasant feelings that may arise when an Internet addict is not able to use the Internet, and excessive use reflects Internet use that is unregulated, and exceeds normal expectations. The seven themes that emerged from the thematic analysis are described in the subsections below.

6.2.3.1. Negative consequences. Items tapping into the theme of negative
consequences are found within the criteria for other established addictive disorders. For example, the *DSM-IV* (APA, 1994) criteria for Pathological Gambling (Appendix C) include the item “has jeopardised or lost a significant relationship, job, or educational or career opportunity because of gambling”. This theme is also represented in the *DSM-IV* Substance Dependence criteria (Appendix A) by the items, “important social, occupational, or recreational activities given up or reduced”, and “use continues despite knowledge of adverse consequences (e.g., failure to fulfill role obligation, use when physically hazardous)”. As stated above, negative consequences was the most prominent theme found within the thematic analysis. This result was not unexpected, as Chapter 2 revealed that the experience of negative consequences is one of the fundamental symptoms of addiction. The only measure that did not have a factor corresponding to the theme of negative consequences was the OCS (Davis et al., 2002), but this is not surprising considering this measure focuses on cognitions related to Internet Addiction, rather than behaviour and outcomes.

6.2.3.2. Loss of control. In the *DSM-IV* (APA, 1994) criteria for Substance Dependence, the item “substance taken in larger amounts and for longer periods than intended” seems to reflect a loss of control over the substance. Interestingly, there is no item that relates to loss of control in the Pathological Gambling criteria. Given this situation, it is not surprising that the two measures that did not include a loss of control factor – the IAT (Young, 1998) and the PIUQ (Thatcher and Goolam, 2005) - were both based on Pathological Gambling criteria and/or measures. It seems then that the inclusion of items relating to loss of control has stemmed from one of three sources: substance-related addiction criteria, behavioural symptoms of Internet Addiction, or clinical interviews.

6.2.3.3. Online social enhancement. Online social enhancement is not included in the criteria of any other addiction, behavioural or otherwise. This is because it originates from theories proposed by Davis et al. (2002) and Caplan (2002), which state that Internet Addiction is related to the unique context of communication available on the Internet. The addition of items measuring online social enhancement represents a strong point of difference between instruments based on theory, and those that are not. As this is a unique factor of Internet Addiction, it is possible that the OCS (Davis et al., 2002), the GPIUS (Caplan, 2002), and the PIUQ (Thatcher & Goolam, 2005) may come closer to achieving construct validity than other instruments.
6.2.3.4. Preoccupation. Preoccupation is not represented in the *DSM-IV* (APA, 1994) criteria for substance-related disorders, but it is present in the criteria for Pathological Gambling. This is evident in the Pathological Gambling diagnostic criteria “is preoccupied with gambling (e.g., preoccupied with reliving past gambling experiences, handicapping or planning the next venture, or thinking of ways to get money with which to gamble)”.

Given that the IAT (Young, 1998) is based on the Pathological Gambling criteria, it is unusual that a factor relating to preoccupation was not evident within Chang and Law’s (2008) analyses. However, factor analysis of the IAT from an alternative source did include salience, which fits within the theme of preoccupation (Widyanto & McMurren, 2004). As Chang and Law point out, the diverging factor structures in these two studies may have been due to cultural differences between the two samples involved. Interestingly, a more recent factor analysis of the IAT also did not identify a distinct factor that fits within the theme of preoccupation (Widyanto et al., 2011).

6.2.3.5. Mood alteration. The origins of the mood alteration theme appears to stem from the *DSM-IV* (APA, 1994) criteria for Pathological Gambling, as it includes the criterion, “gambles as a way of escaping from problems or of relieving a dysphoric mood (e.g., feelings of helplessness, guilt, anxiety, depression)”. It is interesting to note that the factor analyses performed on the IAT (Young, 1998) and the PIUQ (Thatcher & Goolam, 2005) did not identify factors tapping in to mood alteration, as both of these scales are based on Pathological Gambling criteria and measures (see Table 6.3.). In fact, the IAT does include one item relating to mood alteration, but it was included in the factor withdrawal and social problems in Chang and Law’s (2008) analysis.

As mentioned in Section 6.2.3, only three measures included a factor relating to the theme of mood alteration; the OCS (Davis et al., 2002), the GPIUS (Caplan, 2002), and the IRPS (Armstrong et al., 2002). In regards to the OCS and the GPIUS, this inclusion in not surprising, given that these measures are theoretically related, and were both influenced by Pathological Gambling symptoms.

In terms of the IRPS (Armstrong et al., 2000), the existence of the mood modification factor is unexpected. As shown in Table 6.3, the IRPS was based on the *DSM-IV* (APA, 1994) diagnostic criteria for Substance Abuse (see Appendix E), which does not include any particular criterion relating to mood alteration. In fact, the appearance of the mood modification factor stems from additional items that were
added in to this measure, such as “I have used the net to make myself feel better when I was down” and “I have used the net to talk to others when I was feeling isolated”. The origins of these items are unclear, but may have been influenced by other existing measures at the time.

6.2.3.6. Withdrawal. Withdrawal is represented in the DSM-IV (APA, 1994) diagnostic criteria for other forms addiction including Substance Dependence: “characteristic withdrawal symptoms; substance taken to relieve withdrawal”, and Pathological Gambling: “is restless or irritable when attempting to cut down or stop gambling”. Given the apparent importance of withdrawal for both of these established forms of addiction, the omission of factors relating to withdrawal in the majority of measures is a curious result. One possible explanation is that most measures used single items to measure withdrawal, which would not be enough to create a distinct factor. Instead, withdrawal-related items may be loading onto other factors.

6.2.3.7. Excessive use. Neither the DSM-IV (APA, 1994) entries for Pathological Gambling or Substance Dependence include criteria relating to excessive use. As a result, the inclusion of items relating to excessive Internet use in the IAT (Young, 1998) and GPIUS (Caplan, 2002) most likely stems from the popular belief that spending a large amount of time performing a particular behaviour, such as exercise or eating chocolate, is an indicator of the presence of addiction (Leon & Rotunda, 2006). However, there is no established cut off for what constitutes excessive Internet use (Grohol, 2007, October 7). In fact, due to the increasing prevalence of Internet use in society, the goalposts for what equates to excessive use would presumably shift over time. Evidence for this can be found by comparing frequency of use data from older and more recent studies on Internet use. For instance, an older study by Anderson (2001) revealed that Internet addicts were spending around 3 hours per day engaging in Internet use. However, a recent review (Kuss et al., 2014) reported that 3 hours is now the average daily level of Internet usage by non-addicts.

Furthermore, as several authors point out (Caplan, 2005; Griffiths, 1999), excessive time spent online does not automatically qualify an individual as addicted. In fact, there are many non-problematic Internet behaviours that would involve extended periods of time online, such as study or work-related research (Grohol, 1999, 27 May). Young (1998) also takes this view, stating that the amount of damage that the Internet causes in an individual's life is more important than the amount of time they spend online per day. It is further worth noting that Caplan (2010) removed
items measuring excessive use from the updated version of the GPIUS – the GPIUS2 - as it was not found to be a reliable predictor of the development of Internet Addiction (Caplan, 2003).

Leon and Rotunda (2000) point out the importance of attending to contextual factors when investigating frequent or excessive Internet use. In some cases, labeling frequent users as addicts may be misleading, and even damaging for certain individuals. In support of such an argument, it is not hard to imagine instances where physically restricted people, who are confined to their beds, may spend upwards of six hours a day using the Internet. Rather than being a symptom of Internet Addiction, their frequent use may instead be a way of staving off boredom or loneliness, as the Internet provides them with entertainment and a means of social interaction. On the other hand, if preoccupation and loss of control are important components of Internet Addiction, it is likely that excessive use is also a relevant factor, albeit an unreliable one. Due to this, excessive use is a variable worth looking at in studies of online addiction, but it should perhaps be analysed on the proviso that it occurs in the context of other, more reliable, symptoms.

6.2.3.8. Supporting research. The systematic review by Lortie and Guitton (2013; see Section 6.2.1) included seven prominent themes within the factors of Internet Addiction measures. The themes identified by those authors correspond almost entirely with those reported in this chapter, with two exceptions. First, Lortie and Guitton identified a theme that they called escapism, which refers to use of the Internet to escape from problems. As can be seen in Table 6.3, this theme was not apparent in the present data (although it has similarities with the theme of mood alteration). This contrasting result seems to reflect differing exclusion criteria for instruments in the systematic review stage; Lortie and Guitton did not filter measures by academic presence. Second, Lortie and Guitton did not include a separate theme relating to excessive use. Instead, they combined factors measuring excessive use with those measuring loss of control to create a theme titled compulsive use. In contrast, the present thematic analysis included excessive use as a distinct theme. This decision was primarily based on the fact that the GPIUS contained separate factors for both compulsive use and excessive time online. However, as explained above, there is a compelling argument to suggest that excessive use may not be a distinct theme of Internet Addiction.
6.3. Conclusion and Summary

Phase 1 of the research design of this thesis was designed to identify the common factors found within reliable, valid, and commonly used Internet Addiction instruments. In order to achieve this aim, a systematic review of Internet Addiction instruments was undertaken, followed by thematic analysis of the identified factors within these instruments.

Through the data analysis and discussion provided within this chapter, as well as work performed by other researchers (i.e., Lortie & Guitton, 2013), it appears as if the core symptoms of Internet Addiction are negative consequences, loss of control, online social enhancement, preoccupation, mood alteration, withdrawal, and excessive use. If this is the case, many popular measures of Internet Addiction seem to be lacking, due to the fact that they do not include factors to assess all of these symptoms. For example, the most popular Internet Addiction instrument - the IAT (Young, 1998) - does not include any items measuring online social enhancement. The same can also be said for the IRPS (Armstrong et al., 2000) and the PIUQ (Demetrovics et al., 2008). In fact, only three popular measures of Internet Addiction do include this factor: the OCS (Davis et al., 2002), the GPIUS (Caplan, 2002), and the PIUQ (Thatcher & Goolam, 2005).

It is interesting to note that of the measures included in the thematic analysis, only the GPIUS (Caplan, 2002) seems to measure all seven of the core symptoms of Internet Addiction identified here. Due to this, the GPIUS would appear to have a greater degree of construct validity than other instruments, and may be one of the best choices for researchers looking for an Internet Addiction instrument. Strengthening this argument is the fact that the items of the GPIUS were developed using multiple sources: previous research and evidence from Internet addicts. This sets the GPIUS apart from all of the other instruments identified in Table 6.3, with the exclusion of the IAT.

It is worth pointing out that Caplan (2010) has recently revised and updated the GPIUS. The new version, the GPIUS2, takes into account more recent research relating to Internet Addiction. Factor analysis of this measure reveals that it contains five factors: preference for online social interaction, mood regulation, cognitive preoccupation, compulsive Internet use, and negative outcomes. These factors fit within the seven core symptoms identified within this chapter, with the exception of excessive use and withdrawal. As Caplan explains, GPIUS items relating to excessive use were included in the compulsive use factor, while items relating to
withdrawal were incorporated into cognitive preoccupation.

Further research should aim to enhance the GPIUS2 (Caplan, 2010), perhaps by including items based on observations of Internet addicts. Moving in this direction would allow researchers to understand whether there are any more unique factors that should be included in Internet Addiction instruments. In addition, researchers should assess the relevance of some of the factors identified within measures with low academic presence, such as *sleep disturbances and deception* (Rotunda et al., 2003). In addition, the relevance of factors that were excluded from the thematic analysis (reality substitution, distraction, and tolerance) should also be examined.

Before concluding this chapter it is important to mention some of the limitations of the methods used in Phase 1 of the research design. First, the use of only two academic databases to search for literature may have limited the potential for identifying an exhaustive list of measures of Internet Addiction. In spite of this, the present review did identify a greater number of instruments compared with two other recently published systematic reviews of Internet Addiction (Kuss et al., 2014; Lortie & Guitton, 2013). Second, the process involved in the thematic analysis only allowed for the generation of themes based on common factors found in measures of Internet Addiction. It is, of course, possible that additional important factors of Internet Addiction have been identified elsewhere, but due to the method used here, were not included in the results. Third, performing a thematic analysis of factors may have introduced a degree of subjectivity to the results. However, as mentioned previously, the results demonstrated here tend to align with the results of Lortie and Guitton’s study.

Despite the limitations associated with the design of Phase 1, the results presented here are considered to represent the common components of Internet Addiction. As mentioned above, they are also strongly supported by previous research (Lortie & Guitton, 2013). However, as stated at the beginning of this chapter, Phase 1 of the research design was developed to inform the creation of a series of open-ended questions with which to measure Facebook Addiction. Therefore, while the findings presented here are both interesting and germane to the field of Internet Addiction research, it is important to now move on to Phase 2 of the research design, which involves a qualitative exploration of Facebook Addiction.
Chapter 7
Phase 2: Qualitative Study of Facebook Addiction

As discussed in Chapter 5, Phase 2 of the research design was developed to answer RQs 2 to 4, inclusive. RQ2 asks whether symptoms of Internet Addiction can be used to identify Facebook addicts, RQ3 addresses the possibility that Facebook Addiction may involve new and unique symptoms, and RQ4 relates to whether Facebook Addiction can take different forms. Based on these three research questions, the aims guiding this research phase were: (a) to verify the existence of Facebook Addiction using common symptoms of Internet Addiction, (b) to identify unique symptoms of Facebook Addiction, and (c) to assess evidence suggesting that there are various forms of Facebook Addiction.

In order to achieve the aforementioned aims, a qualitative study was designed using online focus groups. As will also be explained, a short online survey was also used, but this was mainly for the purposes of screening suitable participants. The present chapter provides an in-depth account of these methods. As somewhat novel methods of recruitment (Facebook Advertisement) and data collection (online focus groups) were used in this phase, the method section within this chapter is explained in detail. While these methods did not lead to the collection of a substantial dataset, the detail provides important context for improvements that were made in the revised design of Phase 3 and provides insights for researchers regarding which elements of online methods may work, and which may not.

Following the method section, the findings and discussion are presented. The present chapter also includes a section outlining the limitations of the research design and methods (Section 7.4). The inclusion of this section is necessary in light of the fact that the resulting dataset was limited. Section 7.4 also provides the necessary context for understanding the revised design used in Phase 3 (see Chapter 8).

7.1 Method

As outlined in Chapter 6, Phase 1 of this thesis led to the identification of seven common symptoms of Internet Addiction. As previously explained, the primary purpose for that research phase was to provide the basis for a mixed methods exploration of Facebook Addiction. As such, the symptoms identified in Phase 1 were
incorporated into Phase 2. This section describes the methods used to conduct Phase 2.

**7.1.1. Participants.** A purposive sample of Facebook users was recruited for Phase 2. Recruitment was constrained by several inclusion criteria. All participants were required to be:

- Facebook members
- Concerned about their current, or previous, levels of Facebook usage
- Able to access the Internet independently, as all recruitment and data collection took place online.
- Over the age of 18, so that informed consent could be obtained.
- Proficient in written English, as the online focus groups were text-based and in English.
- Residents of Australia, New Zealand, Canada, the United Kingdom, or the United States of America. This restriction ensured that a list of relevant mental health resources was available to participants in case of emotional or psychological distress during research participation. These particular countries were chosen on the basis that they are English-speaking and over 50% of their populations use Facebook.

Figure 7.1 summarises the flow of participants through the study from the point of recruitment to the end of data collection. As can be seen, the majority of individuals who completed the screening survey dropped out before participating in the focus groups. Of the five participants who did continue to the focus groups, only three answered all of the structured open-ended questions. The unfortunate result of this outcome was a lack of interaction between participants in the focus groups. There was also a lack of interaction between most participants and the moderator. Thus, the qualitative data collected in the focus group are less detailed than expected. Potential reasons for the lack of participation in the focus groups are offered in Section 7.4.

As Figure 7.1 shows, the sample of survey respondents comprised 34 Facebook users (16 males and 18 females). Participants were aged between 18 and 51 ($M = 29.76$, $SD = 10.78$), and were residents of Canada (47%), the United Kingdom (35%), the United States of America (15%), and New Zealand (3%). Further descriptive data about survey respondents is provided in Section 7.3.1. Five
Figure 7.1. Flow of participants through the Phase 2 research study. Adapted from “Measures of Social and Emotional Skills for Children and Young People: A Systematic Review,” by N. Humphrey et al., 2011, Educational and Psychological Measurement, 71, p. 621. Copyright 2011 by Sage.
participants took part in the online focus groups, but only three completed all the questions. The five focus group participants were predominantly female (75%), were aged between 33 and 40 years (M = 38, SD = 3.37) and resided in Canada (75%) and the UK (25%). Only four focus group participants gave responses that were included in the thematic analysis. Further details about these participants are presented in Table 7.1 below.

Table 7.1

Demographic Information for Focus Group Participants whose Responses were Included in the Thematic Analysis (N=4)

<table>
<thead>
<tr>
<th>Identifier</th>
<th>Sex</th>
<th>Age</th>
<th>Country</th>
<th>Daily Facebook Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>Female</td>
<td>25</td>
<td>Canada</td>
<td>5-6 hours</td>
</tr>
<tr>
<td>Participant 2</td>
<td>Female</td>
<td>33</td>
<td>Canada</td>
<td>2-4 hours</td>
</tr>
<tr>
<td>Participant 3</td>
<td>Female</td>
<td>40</td>
<td>Canada</td>
<td>12-16 hours</td>
</tr>
<tr>
<td>Participant 4</td>
<td>Female</td>
<td>40</td>
<td>Canada</td>
<td>2-4 hours</td>
</tr>
</tbody>
</table>

7.1.2. Materials. For Phase 2 of the research design, data was collected using two methods: a nine-item online screening survey and a schedule of five online focus group questions. This section describes both of these materials, as well as the development of the discussion board for the online focus group.

7.1.2.1. Online screening survey. To ensure that participants met the inclusion criteria for the focus group, and to assess their suitability for the study, a nine-item online screening survey was created (see Appendix F). This was published on the survey hosting website Survey Monkey (www.surveymonkey.com). The first three items on the survey asked for participants’ age, sex, and country of residence. These questions were included to obtain an understanding of the demographic variables of the sample, as well as to ensure that all participants met the inclusion criteria (see Section 7.1.1). Any participants who did not meet the inclusion criteria were redirected to an external “Thank You” page, and their data was deleted.

Following the demographic questions, three questions relating to Facebook usage were included. These questions focused on whether the participant had a Facebook account, the average amount of time spent per day on Facebook for non-work related purposes, and how often Facebook was used on devices other than a
computer. The first of the Facebook-specific questions was a screening question designed to ensure that all participants were Facebook users. Participants who had answered ‘No’ to this question were redirected to the “Thank You” page and automatically removed from the survey. The following two questions provided information about the average intensity of Facebook use among this sample.

The third section of the survey included two further screening questions. The first of these took the form of a 5-point Likert-type rating scale. The purpose of this scale was to measure each participant’s level of concern about their own Facebook usage. Answers for this question ranged from 1 = “Not at all concerned” to 5 = “Extremely concerned”. Participants selecting “Not at all concerned” did not meet the inclusion criteria, and were redirected to the “Thank You” page. Participants with ratings of 2 or greater were asked to explain what concerned them about their Facebook usage.

The answer format of the above question was deliberately designed to be open-ended so as to avoid the possibility of limiting participants to predetermined categories created by the researcher. However, it was important that responses were relevant to the experience of problematic or addictive Facebook use, rather than other potential issues. Therefore, some example responses were provided to participants, such as “I spend too much time playing Facebook Games” and “I use Facebook obsessively to check up on my partner”. While there was a risk that these sample responses would influence the responses of some participants, all participants were given the opportunity to provide more personal and detailed responses about their concerns in the online focus groups.

The final survey question reminded participants that this study involved an online focus group, and asked them to create a unique pseudonym for themselves. The purpose of this question was to match up each participant’s survey and focus group responses; participants who chose to take part in the focus group were asked to use this pseudonym when registering. This aspect of the procedure is explained further in Section 7.1.3. After entering their pseudonym, participants were automatically invited to take part in the online focus group. If participants elected not to enter a pseudonym, they were considered to have dropped out.

7.1.2.2. Focus group questions. A schedule of open-ended questions was created based on the Internet Addiction themes identified in Phase 1 (see Table 7.2.). These questions were designed to guide the online focus group discussion. To avoid participant fatigue, five open-ended questions were used, based on the themes
of negative consequences, online social enhancement, preoccupation, mood alteration, and withdrawal. It was expected that information relating to excessive use and loss of control would be obtained from other sources. For example, the experience of excessive Facebook use could be gleaned from quantitative responses to the screening survey question, “How much time do you spend on Facebook per day?” In regard to loss of control, it was anticipated that the survey question “What concerns you about your Facebook use?” might facilitate discussion of this theme, as might the open-ended focus group questions about their problematic experiences with Facebook use.

Table 7.2

**Internet Addiction Symptoms and Corresponding Focus Group Questions**

<table>
<thead>
<tr>
<th>Internet Addiction Symptoms</th>
<th>Focus Group Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative consequences</td>
<td>Can you think of any instances when your Facebook use interfered with your normal daily activities or caused problems with your personal relationships? If so, can you explain what happened?</td>
</tr>
<tr>
<td>Online social enhancement</td>
<td>How much of your Facebook usage would you say is motivated by a desire to be social, or feel connected to others?</td>
</tr>
<tr>
<td>Preoccupation</td>
<td>Do you have any Facebook-related thoughts when you’re not using Facebook? If so, what are they?</td>
</tr>
<tr>
<td>Mood alteration</td>
<td>Explain what you’re usually doing, or the way you’re usually feeling, when you get the urge to use Facebook. Would you say there’s a particular mood or thought process that precedes your use of Facebook? How do you feel while you’re using Facebook?</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>Think back to a time when you wanted to access Facebook, but couldn’t. How did this make you feel? How do you think you would feel if you couldn’t use Facebook for a week, or a month?</td>
</tr>
</tbody>
</table>

The focus group questions were deliberately broad to encourage answers unconstrained by existing views about online addictions. In this way, there was a greater chance that the qualitative data would provide insights into potentially unique
symptoms of Facebook Addiction.

7.1.2.3. Online discussion board. The online focus groups were held on an online discussion board, custom-made for the project using free open-source forum software (www.phpBB.com). The discussion board was hosted on a virtual machine run from servers in the Amazon Elastic Compute Cloud (http://aws.amazon.com/ec2/).

As illustrated in Figure 7.2, there were two parent topics on the discussion board. The first topic was ‘Information’, and consisted of two forums: ‘Welcome’ and ‘Help and Support Resources’. Within the ‘Welcome’ forum there were three discussion threads containing useful information about the forum rules and instructions for participating in the focus groups. Within the ‘Help and Support Resources’ forum there were four discussion threads. Two of these threads contained useful resources for participants, such as the Participant Information Statement (PIS; see Appendix F) and psychological and crisis support information. The other two threads were designed to be used by participants as a means of asking for help from either the researcher or IT support person.

The second parent topic was ‘Focus Groups’, and this comprised five forums. These forums were created to obtain evidence for different forms of Facebook Addiction (RQ4), and so that participants could engage in discussion with others who had similar concerns. For instance, participants who felt that they were addicted to Facebook Games were instructed to join the Facebook Gaming forum. In order to generate an appropriate level of communication within threads, each forum was designed for four to eight participants. Out of the five individuals who took part in the focus groups, three selected the ‘Combined Concerns’ forum, one selected the ‘Facebook updating’ forum, and one selected the ‘Other Facebook Concerns’ forum.

7.1.3. Procedure. Participants were recruited using a Facebook Ad targeted to appear on the profile pages of Facebook users who were over 18, who listed English as a known language, and who resided in one of the five chosen countries; Australia, Canada, New Zealand, UK and USA. The advertisement was given the heading ‘Do you have a FB\textsuperscript{22} problem?’ in order to attract individuals who had identified themselves as problematic users. This stipulation was considered important, given that data from potential Facebook addicts was desired. Payment of $AU10 worth of iTunes credit was offered for taking part.

\textsuperscript{22} FB is an abbreviated form of ‘Facebook’, and was used due to character restrictions in Facebook Ad headings. This abbreviation would be recognised among a high proportion of Facebook users.
Figure 7.2. Structure of Phase 2 online focus group forums.
Like many other forms of online advertising, Facebook Ads redirect to an external webpage when they are clicked. The Facebook Ad used in this study redirected potential participants directly to the PIS, which, like the survey, was hosted on SurveyMonkey.com. The PIS provided general information about the purpose of the research project and the types of participants sought. It also gave an overview of what was expected of participants, as well as the risks and benefits associated with participation. After reading the PIS, individuals who met the inclusion criteria were invited to give their consent by selecting a checkbox marked “I consent to participate in this study”. Two other checkboxes were also provided, with each labelled “I do not meet the inclusion criteria” and “I do not consent to participate in this study” respectively. Individuals selecting one of these two checkboxes were immediately redirected to the disqualification page mentioned earlier. Individuals who selected the checkbox indicating that they gave their consent were able to access the online screening survey.

After completing the screening survey, the web browsers of participants who had expressed an interest in taking part in the focus groups automatically redirected to the discussion board registration page. Participants were expected to register for the forum by entering their email address and a password, as well as the pseudonym that they had chosen. This pseudonym was used to protect the privacy of focus group participants, and was adopted as the forum username. This was the only identifying information that the moderator and other participants were able to access. Email addresses and passwords were stored in a secure database, which was accessible only by the website administrator – a senior IT expert at RMIT University. A flow chart depicting the entire recruitment process is provided in Figure 7.3.

Prior to the commencement of the online focus group, participants were instructed to visit the ‘Welcome’ forum to read orientation information. Following this, they were asked to self-allocate to the focus group that they felt best represented their concerns, and begin answering questions. Each of the five questions outlined in Table 7.2 were posted in a separate thread in each of the five discussion forums. As the focus group progressed, it was the moderator’s job to ask additional questions of all participants. Just like an offline focus group, this tactic was designed to encourage conversation and tease out further information.

All focus group responses were moderated (checked by the researcher) before they appeared on the forum. There were several reasons for this: (a) it
Figure 7.3. Flow chart of the recruitment process.
ensured that participants did not reveal any personal information about themselves, such as their name or address, (b) it eliminated the possibility that participants would publicly post inappropriate content, and (c) it provided the researcher with the opportunity to ensure that participants were not experiencing any emotional distress. Prior to the start of the study, protocols were put in place to deal with each of these potential situations, should they arise. In addition, there was no function by which participants could interact with each other outside of the threads that were already created; private messaging was turned off for participants and email addresses were not displayed publicly.

7.2. Data Analysis

Raw data from 34 participants who completed the online screening survey were downloaded securely from the Survey Monkey website and imported into PASWStatistics 18.0 (SPSS, 2009) for analysis. Initial inspection of this dataset revealed no missing data. Close-ended data were analysed using descriptive procedures (i.e. frequencies). Open-ended survey data were analysed using the thematic analysis techniques described in Section 5.5. As only a small amount of open-ended data were collected from both the survey and the focus group, qualitative analytical software tools such as NVivo were not used to perform thematic analysis.

Two thematic analyses were performed in this study. The first was based on the open-ended survey responses relating to the types of concerns that participants had about their own Facebook use. The second was based on the focus group responses. These analyses were conducted separately, however, the first step in both analyses was to pool all of the relevant open-ended responses into broad themes. There were no a priori themes used for this initial process; instead themes were allowed to emerge naturally. Following this, the range of broad themes was examined further.

In the first analysis, themes were reported if at least two different participants had provided similar responses. In the second analysis, themes that seemed to fit within any of the seven potential symptoms of Facebook Addiction were retained and reported. This process was guided by the definitions of each symptom provided by the authors of the measures included in Table 6.3 (these definitions are outlined in Section 7.3.3). Themes that did not specifically adhere to the seven symptoms, but

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23 Due to the limited dataset, only one iteration of coding was performed.
were potentially related to Facebook Addiction, were also retained. The latter process was guided by inductive reasoning. Themes that were considered to be irrelevant to Facebook Addiction were excluded at this point.

7.3. Results and Discussion

There were three aims associated with this research phase: to assess whether Facebook Addiction exists, to identify whether there are any unique symptoms or indicators of Facebook Addiction, and to determine whether Facebook Addiction takes various forms. Given that only small amounts of data were collected, it is difficult to argue that the aims of this research phase were fully achieved or that conclusive answers to the research questions were provided. However, although limited, the data obtained from this phase are still worth examining. Furthermore, the results of this study provide insights relating to the utility of online research methods.

7.3.1. Descriptive statistics. Descriptive statistics from the survey are presented in Table 7.3. These statistics relate to three quantitative variables associated with Facebook usage: time spent on Facebook per day, level of concern about Facebook use, and use of Facebook on mobile devices. In order to provide more detail about these variables, the frequencies are broken down by sex and age group. The following subsections provide discussion about each of the three Facebook usage variables.

7.3.1.1. Time spent on Facebook. As summarised in Table 7.3, a high proportion (44%) of survey respondents spent between 2 and 4 hours on Facebook per day for purposes other than study or work. This result remained constant across sex and age group. As discussed in Section 4.4.2, average Facebook use is generally reported to be around 90 minutes per day. This suggests that the sample recruited for Phase 2 were heavy Facebook users, an outcome which was consistent with the recruitment criteria (see Section 7.1.1).

Interestingly, 26% of survey respondents admitted spending more than five hours a day on Facebook. This result indicates that problematic Facebook users (i.e., people with concerns about their Facebook use) are more likely to be heavy users than Facebook users in general. As such, it seems that excessive use may be a legitimate symptom of Facebook Addiction. Of course, an alternative explanation for these results is that the sample was biased, and heavier users were more likely than

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24 While age was measured as a continuous variable in the survey, a polytomous categorical variable called ‘age group’ was created in order to explore patterns of use across a range of ages. A five-year age range was selected for each category.
Table 7.3

Frequencies (and Percentages) of Facebook Usage Variables for Phase 2 Survey Respondents, Broken Down by Sex and Age Group

<table>
<thead>
<tr>
<th>Facebook Use Variables</th>
<th>Sex</th>
<th></th>
<th>Age Group</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td>Male</td>
<td>18-23</td>
<td>24-29</td>
<td>30-35</td>
<td>36-41</td>
<td>42+</td>
</tr>
<tr>
<td></td>
<td>(N = 34)</td>
<td>(n = 18)</td>
<td>(n = 16)</td>
<td>(n = 15)</td>
<td>(n = 4)</td>
<td>(n = 3)</td>
<td>(n = 7)</td>
<td>(n = 5)</td>
</tr>
<tr>
<td>Time spent on FB per day</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 minutes or less</td>
<td>1 (3)</td>
<td>1 (6)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>1 (33)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td></td>
</tr>
<tr>
<td>31-60 minutes</td>
<td>2 (6)</td>
<td>1 (6)</td>
<td>1 (6)</td>
<td>2 (13)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>1-2 hours</td>
<td>7 (21)</td>
<td>3 (16)</td>
<td>4 (25)</td>
<td>5 (33)</td>
<td>1 (25)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>1 (20)</td>
</tr>
<tr>
<td>2-4 hours</td>
<td>15 (44)</td>
<td>7 (38)</td>
<td>8 (50)</td>
<td>5 (33)</td>
<td>2 (50)</td>
<td>2 (67)</td>
<td>4 (57)</td>
<td>2 (40)</td>
</tr>
<tr>
<td>5-6 hours</td>
<td>6 (17)</td>
<td>4 (22)</td>
<td>2 (13)</td>
<td>2 (13)</td>
<td>1 (25)</td>
<td>0 (0)</td>
<td>2 (29)</td>
<td>1 (20)</td>
</tr>
<tr>
<td>6-8 hours</td>
<td>2 (6)</td>
<td>1 (6)</td>
<td>1 (6)</td>
<td>1 (8)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>1 (20)</td>
</tr>
<tr>
<td>More than 8 hours</td>
<td>1 (3)</td>
<td>1 (6)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>1 (14)</td>
<td>0 (0)</td>
<td></td>
</tr>
<tr>
<td>Use on Mobile Devices</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>7 (20)</td>
<td>5 (28)</td>
<td>2 (13)</td>
<td>2 (13)</td>
<td>0 (0)</td>
<td>1 (33)</td>
<td>2 (29)</td>
<td>2 (40)</td>
</tr>
<tr>
<td>Rarely</td>
<td>5 (15)</td>
<td>4 (22)</td>
<td>1 (6)</td>
<td>1 (7)</td>
<td>2 (50)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>2 (40)</td>
</tr>
<tr>
<td>Sometimes</td>
<td>6 (18)</td>
<td>3 (17)</td>
<td>3 (19)</td>
<td>5 (33)</td>
<td>0 (0)</td>
<td>1 (33)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Often</td>
<td>16 (47)</td>
<td>6 (33)</td>
<td>10 (62)</td>
<td>7 (47)</td>
<td>2 (50)</td>
<td>1 (33)</td>
<td>5 (71)</td>
<td>1 (20)</td>
</tr>
<tr>
<td>Level of Concern</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td>1 (3)</td>
<td>1 (6)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>1 (20)</td>
</tr>
<tr>
<td>Mild</td>
<td>8 (24)</td>
<td>4 (22)</td>
<td>4 (25)</td>
<td>5 (33)</td>
<td>2 (50)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>1 (20)</td>
</tr>
<tr>
<td>Moderately</td>
<td>15 (44)</td>
<td>8 (44)</td>
<td>7 (44)</td>
<td>4 (27)</td>
<td>2 (50)</td>
<td>3 (100)</td>
<td>5 (71)</td>
<td>1 (20)</td>
</tr>
<tr>
<td>Very</td>
<td>10 (29)</td>
<td>5 (28)</td>
<td>5 (31)</td>
<td>6 (40)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>2 (29)</td>
<td>2 (40)</td>
</tr>
<tr>
<td>Extremely</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>
light users to see the Facebook Ad that was used to recruit participants.

It is also worth noting that 34% of women admitted spending more than five hours a day on Facebook, compared to only 19% of men. This result supports previous research into the gender differences associated with Facebook use. For example, McAndrew and Jeong (2012) found that women are heavier Facebook users than men, and this is likely due to the fact that they perform a wider range of activities on the site. In particular, women are reportedly more heavily engaged in using Facebook for social activities (Junco, 2013) and social monitoring (McAndrew & Jeong, 2012) than men.

In regards to age, 43% of 36 to 41 year olds and 40% of those aged 42 and over spent more than five hours a day on Facebook. These results suggest that older adults may be the most at risk of becoming excessive Facebook users. Due to the fact that most Facebook-related studies have restricted their samples to adolescents and university students (see Chapter 4), there is scant research to support the findings shown here. One study that did employ a broader sample found that Facebook use was negatively related to age (McAndrew & Jeong, 2012), but that older people engaged in different activities to younger people (such as direct social interaction, and looking at their own profile page). McAndrew and Jeong did not, however, specifically recruit individuals with concerns about their Facebook use. Therefore, the results in this thesis possibly present a more accurate picture of the demographics of excessive Facebook users. While further research is needed to confirm these assumptions, it is possible that some older adults use Facebook excessively because they have large amounts of free time available, and are searching for social connection.

7.3.1.2. Use on mobile devices. A high proportion (47%) of survey respondents reported ‘often’ using Facebook on devices other than computers. This result was expected, given that 1.01 billion people use Facebook mobile products every month (Facebook, 2014). However, 35% of participants also claimed to ‘never’ or ‘rarely’ use Facebook on mobile devices. Interestingly, 50% of women answered in this way, compared to only 19% of men. In addition, 80% of participants aged over 42 years also answered this way. The latter result makes sense, given that a recent survey found that older individuals were less likely to own an Internet-enabled mobile device (i.e., smartphone) than younger individuals (Pew Internet, 2014); however, more research is needed to understand the trends regarding sex.

Overall, the results discussed here paint a picture of two groups of problematic
Facebook users: those who use Facebook on computers and mobile devices, and those who predominantly use Facebook on computers. Based on the data in Table 7.3, it seems that women and older adults are more likely to fall into the latter category, but further research is necessary to confirm this. In addition, it would be interesting to assess whether heavy or frequent use was specifically tied to use on computers or mobile devices. As discussed in Section 4.4.3, it is possible that frequent checking of Facebook is linked to use on mobile devices, while heavy use is associated with using Facebook on computers.

An alternative explanation for the results discussed above is that the sample may have been biased towards people who use Facebook predominantly on computers. This is because Facebook Ads are only displayed on computer browsers, thus not including mobile-only Facebook users. This topic will be revisited again in Phase 3 (Chapter 8).

7.3.1.3. Level of concern. As shown in Table 7.3, the majority of participants (73%) were moderately or very concerned about their own Facebook use, and this result was constant across sex. In contrast, the results across age group paint a different picture; 67% of participants aged 18 to 23, and 100% of participants aged 36 to 41 were moderately to very concerned about their Facebook use, while the other age groups were less concerned. In light of these results, it may be that individuals aged 18 to 23 and 36 to 41 are more likely to be Facebook addicted, or perhaps they are more likely to be aware that their Facebook use is problematic. On the other hand, the small sample size may be skewing these results. This topic will be revisited in Phase 3 (Chapter 8), where a larger sample was recruited.

Given that the vast majority of participants had at least moderate levels of concern over their Facebook use, it seems that the recruitment advertisement was successful. However, none of the participants had extreme concern, which may indicate a failure to recruit Facebook addicts. This is possible, as the recruitment advertisement did not directly ask for participants who were addicted. Alternatively, it could be the case that participants were addicted to Facebook, but were in denial. The latter explanation is certainly possible, as denial is a common occurrence among many types of addicts (Gainsbury & Blaszczynski, 2012; Li, Ding, Lai, Lin, & Luo, 2011; Sohn & Choi, 2013).

7.3.2. Open-ended survey data. The open-ended data collected from the survey question "Can you briefly describe what concerns you about your Facebook usage?" provided insights relevant to the research questions. As illustrated in Table
analyses of these data revealed nine themes: too much time, checking up on people, excessive game-playing, checking for new content too often, lack of social life outside of Facebook, obsession, addiction, privacy, and inappropriate behaviour.

Table 7.4

Themes and Example Responses from Open-Ended Survey Responses (N = 30)

<table>
<thead>
<tr>
<th>Theme</th>
<th>n</th>
<th>Example response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Too much time</td>
<td>15</td>
<td>“I spend too much time on Facebook in general”</td>
</tr>
<tr>
<td>Checking up on people</td>
<td>8</td>
<td>“Too much time checking friends and friends of friends”</td>
</tr>
<tr>
<td>Excessive game-playing</td>
<td>7</td>
<td>“I spend too much time playing Facebook Games”</td>
</tr>
<tr>
<td>Checking for new content</td>
<td>4</td>
<td>“Check news feed constantly”</td>
</tr>
<tr>
<td>Obsession</td>
<td>3</td>
<td>“On [Facebook] any time I can just as a OCD thing now”</td>
</tr>
<tr>
<td>Lack of social life</td>
<td>2</td>
<td>“Facebook seems to be my main social interaction in life”</td>
</tr>
<tr>
<td>Addiction</td>
<td>2</td>
<td>“I want to stop [using Facebook] but I feel addicted”</td>
</tr>
<tr>
<td>Privacy</td>
<td>2</td>
<td>“I wonder about computer security”</td>
</tr>
<tr>
<td>Inappropriate behaviour</td>
<td>2</td>
<td>“I get blocked [on Facebook] because I send requests to people”</td>
</tr>
</tbody>
</table>

In regard to the first aim of this research phase, the thematic analysis of the open-ended data provided some support for the argument that Facebook Addiction does exist. Two participants independently referred to feeling “addicted” to Facebook, and both indicated that they were very concerned about this. In addition, three participants mentioned using Facebook “obsessively”. These responses all indicate a loss of control over Facebook usage.

It is worth noting that almost half participants felt that they were spending too much time using Facebook, and the majority of these participants were moderately or very concerned about this situation. Recognition that one is spending too much time on Facebook may be a consequence of excessive use. These sorts of statements suggest that excessive use of Facebook is a common issue among people with concerns about their Facebook use; however, as discussed previously, excessive

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25 The n in Table 7.4 refers to the number of participants who gave a response coded within this theme.
26 The responses of four participants were excluded as they did not fit within existing themes.
27 The term “addiction” was deliberately not used at any time in the PIS, survey questions, or focus group.
use on its own is not necessarily indicative of Facebook Addiction.

The thematic analysis also revealed that there were three main types of Facebook activities participants were concerned about: checking up on people, playing games, and checking for new content. As discussed in Section 4.4.4.2, all of these kinds of uses may be linked to excessive Facebook use. For example, Foregger (2008) found that using Facebook for game playing or social observation was associated with heavy Facebook use, while Hart’s (2011) results suggested that passive engagement with social or entertainment-related content was linked to more frequent Facebook use. Interestingly, the mean age of participants who were concerned about these three areas in the present study differed considerably: 23 years for checking content, 29 years for checking up on people, and 43 years for playing Facebook Games.

The fact that these three types of activities were causes of concern for participants suggests that they may play a role in Facebook Addiction. For example, it is possible that some individuals engage in these behaviours regularly on Facebook because they provide negative reinforcement through the alleviation of unwanted mood states. Several participants revealed that they were concerned that they were using Facebook to check up on particular individuals, such as children or romantic partners. This behaviour could be motivated by the desire to ameliorate emotions such as jealousy, loneliness, or anxiety. Likewise, playing games and checking for new content could be triggered by boredom, loneliness, or the desire to procrastinate. No matter which type of negative mood state is being experienced, when reinforcement occurs, it is likely that this behaviour will be repeated in the future as a method of altering negative mood states. As such, the potential for the development of loss of control may increase. Further research should aim to establish whether these kinds of Facebook activities are linked to Facebook Addiction, and whether people with certain demographic characteristics (i.e. age) are at greater risk.

Of course, while these data provide tentative evidence to suggest that Facebook Addiction may take different forms, it cannot be confirmed that the participants who had these concerns were actually addicted. Nevertheless, the fact that these themes arose in the data suggests that they may be common to concerned Facebook users. Therefore, future research should aim to establish whether there is a link between such behaviours and Facebook Addiction.

7.3.3. **Focus group data.** The survey results discussed above provide
tentative support for the existence of two Internet Addiction symptoms among potential Facebook addicts: loss of control and excessive use. Therefore, partial support for RQ2 was provided. However, Phase 2 was designed so that the focus group discussion would provide more detailed data in order to answer RQ2, which related to the usefulness of Internet Addiction symptoms for measuring Facebook Addiction, and RQ3, which asked whether there are any unique symptoms of Facebook Addiction\(^{28}\). The findings relating to these data will now be discussed. Where direct quotes from focus group participants have been used, participants have been numbered.

7.3.3.1. **Negative consequences.** Negative consequences are the undesirable outcomes that occur from excessive and addictive Facebook use. In this thesis, participants were considered to be experiencing negative consequences if they used Facebook instead of performing other important activities, they reduced their recreational activities to spend more time on Facebook, or if their excessive Facebook use had caused problems within their interpersonal relationships.

Three participants provided responses indicating that they had experienced negative consequences. Thematic analysis of these data generated three main themes: jeopardising important relationships, neglecting daily activities, and neglecting offline social interactions. All three of these areas clearly fit within the definition of negative consequences provided above, and are represented in *DSM-5* (APA, 2013) criteria for Gambling and Substance-Related Addictive Disorders.

The following examples demonstrate how Facebook use had interfered with relationships:

“…find myself talking to people less frequently, because I know what's going on in their lives by their posts.” (Participant 1)

“My husband hates Facebook. He says it takes me away from him and he doesn’t want me airing our personal life for everyone to see.” (Participant 2)

“My husband and son have complained many times that all I do is Facebook. My husband has even commented that I love Facebook and the computer more than him. Often when he talks to me I am so embroiled in what’s going on on the computer I don’t hear him.” (Participant 3)

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\(^{28}\) Focus group allocation and discussion was also expected to provide answers to RQ4, which asked whether Facebook Addiction takes different forms.
Two participants also suggested that Facebook was interfering with their ability to complete daily chores or leisure activities. For example:

“I should be cleaning the house or doing ANYTHING else, even reading a book, and then nothing gets done because I’ve wasted so much time on the computer.” (Participant 2)

“…Facebook has interfered with most of my daily functioning. I usually spend 12-16hrs on the computer. Any other interests I have had in life have all gone to the wayside. My housework is almost non-existent now…often I don’t even go to the washroom for hours like a zombie sitting there.” (Participant 3)

Focus group participants did not provide any data to indicate that Facebook use had interfered with their vocational or educational pursuits. However, this may be because they were neither employed nor students. Further research should therefore aim to assess the impact of Facebook use on individuals with vocational or educational commitments.

7.3.3.2. Online social enhancement. Online social enhancement is defined by the feeling that communicating on Facebook is preferable to face-to-face interaction, or that it was necessary to obtain a feeling of social connectedness. In the present thesis, the following types of responses would be classified as online social enhancement: feeling safer, more efficacious, more confident, or more comfortable communicating on Facebook, considering oneself to have higher levels of social control on Facebook, and feeling reliant on Facebook for social interaction.

Only three participants provided responses that were classified as online social enhancement. One indicated that she felt more comfortable communicating on Facebook than offline:

“I am very uncomfortable around people, so Facebook allows me to follow others lives without sustaining conversation. I can take time to think of replies or comments instead of being put on the spot as when talking to people in person.” (Participant 1)

This type of response suggests that the individual has a preference for Facebook communication stemming from social anxiety. This finding supports both the cognitive behavioural model (Davis, 2001) and the social skill theory (Caplan, 2002) of Generalised Problematic Internet Use (see Section 3.4).

Interestingly, all three respondents felt that they were reliant on Facebook for
their social interaction:

“Most of my socializing is done through Facebook, I find it a way to stay connected to people with little effort.” (Participant 1)

"As a stay-at-home mother, I don't get much “real” social interaction but on FB I can connect with my friends and people I don’t see often. I definitely have more of a social life since I started using Facebook.” (Participant 2)

"At this time most of my socializing is through Facebook. I have recently moved to another Province in an isolated area." (Participant 3)

It is worth noting that the two latter comments indicate that reliance on Facebook was due to life circumstances, rather than feeling that Facebook interaction was easier or more comfortable (as alluded to by Participant 1). These references fit within the Social Comfort factor (see Table 6.3) put forward by Davis et al. (2001).

7.3.3.3. Preoccupation. Preoccupation refers to the experience of persistent thoughts about using Facebook. In this thesis, thoughts about using Facebook again, or planning the next time Facebook use would occur were considered indicative of preoccupation.

Four participants provided responses indicating that they thought about Facebook when they were not using it. These thoughts were classified into three main themes: providing new content, checking posted content, and playing games. As these three activities correspond almost entirely with the concerns that arose in the survey (see Section 7.3.2), further research should establish the role that they play in the development of Facebook Addiction.

Two participants provided examples of preoccupation with posting content:

“The thoughts of my potential status updates don’t seem to detract from the moment, as long as I keep them in my head. It helps to "memorize" the moment and shows me what I think is important in my life. If I was running to the computer all day actually typing in every status update I thought about, now that would be bad.” (Participant 2)

“When not actually on Facebook I spent much time composing responses to others status updates in my head. I find it hard to get to sleep at night doing this. Often I just lay there composing Facebook messages and responses in my head where it bothers me so much I will get up out of bed and go post them on Facebook. I think about Facebook when I'm out doing other things and sometimes even cut my time short doing activities so that I can get back to the computer and post my thoughts.” (Participant 3)
In addition, three participants thought about checking posted content on Facebook:

"I wonder if people have read my posts, and what they may have posted." (Participant 1)

"Sometimes my thoughts are wondering if anyone has replied to my messages or posts." (Participant 3)

"I frequently find myself thinking about what information my children are posting on Facebook and if I have any new messages or posts." (Participant 4)

Finally, one participant mentioned thinking about Facebook games:

"I also time many games so I know when my next level or activity is ready, and keep track of when I can play them again." (Participant 1)

It is clear from these responses that some participants have experienced repetitive thoughts about posting or receiving content on Facebook, as well as playing Facebook Games. In fact, these responses indicate that some Facebook users can become preoccupied with planning the next time they use Facebook. In Participant 3’s case, it seems that was preoccupied with Facebook as her thoughts were interfering with her ability to get to sleep at night. This finding aligns with the DSM-IV (APA, 1994) description for preoccupation with gambling (see Appendix C), and tentatively supports the inclusion of preoccupation as a symptom of Facebook Addiction. On the other hand, Participant 2 remarked that her Facebook-related thoughts were not detracting from her life. Based on this response, the level of intrusion experienced by the individual could be an important distinction for future instrument items or diagnostic criteria for Facebook Addiction.

7.3.3.4. Mood alteration. Mood alteration involves the repeated use of Facebook to escape from dysphoric moods states. In this thesis, moods such as loneliness, depression, and anxiety were considered to be dysphoric.

Only three participants provided responses suggestive of mood alteration. For example:

“Sometimes I am lonely and just want to see what others are doing or see a cute picture to cheer myself up. “(Participant 2)

When this participant was asked to explain whether Facebook helped her to feel less lonely, she responded:
"I do feel less lonely when I connect with others on Facebook. I feel like I've had a chance to help someone by giving advice or shared in their laughter or consoled them when they are going through a rough spell." (Participant 2)

Interestingly, while another participant also admitted that using Facebook helped her feel less lonely, she indicated that her Facebook use was not particularly tied to her moods:

"I logon very frequently, no matter what mood I am already in." (Participant 1)

In addition to the examples above, one participant provided several comments regarding her experiences of using Facebook for mood alteration. For example, she wrote:

“I post most often when I am upset or angry. Then I am sitting there waiting for responses. If I get none I am even angrier. I am a rollercoaster of emotions if I have an issue in my life - post it - and get no response; then I am often more upset by getting no response! Boredom also finds me lurking about Facebook and feeling much irritation and frustration when there is little going on. Sometimes when I am bored I just post random things to watch people's responses.” (Participant 3)

In the DSM-IV criteria (APA, 1994) for Pathological Gambling (see Appendix C), mood alteration is described as follows: “gambles as a way of escaping from problems or of relieving a dysphoric mood”. These data show some support for the argument that individuals use Facebook for the purpose of mood alteration. Interestingly, while Participant 1 admitted that using Facebook made her feel less lonely, she found herself using it frequently regardless of the mood that she was in. This finding can be interpreted in one of two ways. First, the development of Facebook Addiction may occur without the experience of using it for mood alteration. On the other hand, use that is triggered by a desire to escape from negative moods may become less important once deficient self-regulation (preoccupation and loss of control) has begun.

7.3.3.5. Withdrawal. Withdrawal refers to the physical or emotional effects that occur when Facebook use is ceased for a significant period of time. For the purposes of this thesis, withdrawal was classified as the experience of unpleasant feelings (i.e. anxiety), difficulties staying away from Facebook, and feeling lost without Facebook.

Two participants provided responses fitting the classification of withdrawal, as they both specifically admitted feeling anxious when not using Facebook:
"I feel anxious when I cannot access Facebook, even being without a computer or Internet connection leaves me upset." (Participant 1)

"I've tried not turning on the computer for a few hours and as I am doing my daily activities I am anxious to turn on Facebook." (Participant 3)

Given that the DSM-IV (APA, 1994) criteria for Pathological Gambling (see Appendix C) includes the criteria ‘is restless or irritable when attempting to cut down or stop gambling’, it appears as if Facebook users can experience withdrawal. However, it seems that while the initial adjustment period without Facebook may be challenging, life without Facebook can be advantageous:

"One year I gave up Facebook for Lent. It wasn't that bad. I found I got so much more done, especially since I wasn't playing any games. My house was much cleaner and I had more time to work out and spend with my family." (Participant 2)

"I found after a few months [of not using it] I thought less and less about Facebook. I was much less agitated and upset. Although I sometimes felt I was missing out on people's lives, I ended up phoning people more and having actual live conversations. I did much more activity wise and found my health was much better not being on Facebook." ( Participant 3)

It is interesting to note that, while both Participant 2 and 3 acknowledged that life without Facebook was improved, both users returned to using it regularly. In fact, at the time of this study, they both had moderate levels of concern about their Facebook use. This could indicate that while it may be fairly simple for Facebook addicts to stop using Facebook, rates of relapse are high. This is another potential area that researchers could examine, as it has consequences for therapeutic interventions.

7.3.3.6. Loss of control. Loss of control refers to the experience of having trouble limiting Facebook use, or spending longer amounts of time on Facebook than intended. As mentioned in Section 7.1.2.2, there was no specific question relating to loss of control of Facebook use. Instead, it was hoped that comments relating to this symptom would be identified through answers to other focus groups questions. This does appear to have occurred, for example, one participant wrote:

"The games are the worst. Why can't I stop? Or even just play once or twice a week? I always mean to play for 15 minutes and next thing you know, it's been an hour or more." (Participant 2)
The *DSM-IV* (APA, 1994) criteria for Substance Dependence indicate that a loss of control occurs when “the substance is often taken in larger amounts of over a longer period than intended”. Therefore, it does seem as if Participant 2 may have lost control of her use of Facebook Games.

Another comment that may be indicative of loss of control came from Participant 3, who stated feeling like a “zombie” when she was using Facebook. She also admitted feeling addicted to Facebook:

“I am a recovering addict having overcome other addictions - I see it as an addiction really. It gives me pleasure but often at the expense of my health and other live relationships. Even though I feel much emotional pain at times because of Facebook I still keep going back to it. That to me is the essence of addiction.” (Participant 3)

While the above response does not clearly identify a loss of control, it is not inconceivable to argue that this is what is occurring for Participant 3. This argument is strengthened further when considering that she spends between 12 and 16 hours a day using the site, to the detriment of other activities and her relationships.

7.3.3.7. Additional themes. As well as the themes outlined above, there were several additional themes that emerged from questions relating to the following addiction symptoms: negative consequences, mood alteration, and withdrawal. As one of the aims of this research phase was to identify potentially unique symptoms of Facebook Addiction, these findings have been included here despite the limited data set.

The first theme emerged from discussions with Participant 3 and Participant 2 about negative consequences, and relates to the belief that continued Facebook use is necessary to avoid disappointing others. For example:

“I don’t know why I come back [to Facebook Games]. Part of it is that they are so “interdependent” and you really need “friends” to progress so I feel that if I don’t go there, I’m letting my “friends” down. And then I think, “Oh I planted that crop and if I don’t go harvest it, it will spoil, and all that time I wasted before will be even more wasted!” or some nonsense like that.” (Participant 2)

“Genuine friends whom I have no other way to interact with except Facebook express hurt when I have been off [Facebook]. I feel like I am being mean sometimes not going on Facebook for these people.” (Participant 3)

These comments indicate that some Facebook users may feel that they are socially
obligated to keep using aspects of Facebook, even though they realise that their use is causing negative impact in their lives. The same theme of continued Facebook use due to social obligation also emerged in focus groups held with teenagers from the USA (Madden et al., 2013). Given the level of penetration that this site has among real-life social groups, it is possible that this experience may be unique to Facebook. However, further evidence is needed to link this experience to Facebook Addiction.

One participant also indicated that she felt obligated to respond to her friends’ Facebook posts stating:

“I do find it important to me to respond to my friends posts. I think it is rude not to? As if I was having a face-to-face conversation I wouldn’t just sit there silent when they said something; especially something emotional. I find myself quite hurt when no one responds to my posts.” (Participant 3)

For this participant, it seems that posting Facebook status updates is analogous to communicating with friends face-to-face. It is perhaps this kind of belief that leads to the feelings of social obligation associated with Facebook.

In regard to the question about mood alteration, two participants admitted sometimes using Facebook when they were experiencing positive moods. They provided the following comments, respectively:

“Sometimes I am just doing something fun I want to share with my friends.”  
(Participant 2)

“Sometimes I am excited to share news of my life.”  
(Participant 3)

Such behaviour indicates that Facebook addicts may not only use Facebook to escape negative moods, but they may also share information on Facebook in an attempt to maintain or enhance positive moods. As research into alcohol use has shown that drinking to enhance positive moods is associated with the development of alcohol abuse (Cooper, Frone, Russell, & Mudar, 1995), it is also possible that this type of behaviour is related to Facebook Addiction. Therefore, this is an area worth further exploration.

In the data relating to withdrawal, two participants indicated that the absence of Facebook from their lives had left them feeling disconnected. For example, one wrote:

“I think I will miss something or feel disconnected if I do not frequently log in.”
Another revealed that, while she had gone six months without using Facebook, the experience had initially been a cause of consternation:

“At first I felt quite worried that everyone would forget me; my relationships would be destroyed. I spent quite a bit of time worrying and feeling cut off from the world.” (Participant 3)

This experience of disconnection is most likely tied to the feeling that Facebook use is necessary to maintain a sense of social interaction, as discussed in the comments relating to online social enhancement (see Section 7.3.3.2). As research has shown that feelings of disconnection can result in increased Facebook use (Sheldon, Abad, & Hinsch, 2011), this theme may be tapping into a unique form of withdrawal from Facebook. As such, further research is recommended.

7.4. Limitations

While the results provided here appear to support the potential for Facebook use to become addictive, it is important to acknowledge a substantial limitation with this phase of the research design: participation rates. Despite the fact that the Facebook advertisement reached an audience of 1,638,279 Facebook users over three days, the overall participation rate was low. In fact, only three people answered all of the focus group questions. This may have been because participants thought that the focus group required too much commitment, or because they may have thought that talking about their experiences with the researcher and other participants would be too confronting.

While various factors have no doubt contributed to these low participation rates; however, there appear to be four main issues with the methods used. First, it is possible that only a small proportion of Facebook addicts actually recognise that they have a problem. As the recruitment advertisement requested participation from individuals who were concerned about their Facebook use, many potential participants who did not identify that their use is problematic may have been unwittingly excluded. In order to address this issue, it would be necessary to alter the inclusion criteria and recruitment advertisement to target a broader range of Facebook users.

Second, only 3% of participants who clicked on the Facebook advertisement chose to complete the survey. This may be because the level of commitment that
was necessary to participate in the study (e.g., filling out a survey and taking part in a focus group) may have been too great. To overcome this issue, the data collection process could be streamlined. This could be achieved by amalgamating the questions from the online screening survey and the focus group to create a larger survey with a mix of Likert-type, closed-ended, and open-ended questions. Even though the participation rates were low for the online focus group, the resulting data still provided useful insights. Therefore, online focus groups could be used to expand upon the questions in the survey.

Third, participants seemed to find the process of selecting an online focus group based on their specific concerns about Facebook to be confusing. In future studies, the process of focus group selection could be streamlined by using a single focus group. This would increase the chance of participant interaction, even with low numbers. Making this change would also limit confusion, as most participants did not self-allocate to appropriate focus groups. Instead, they may have chosen the focus group at the top of the list, or with the highest level of activity. Incidentally, the failure of the focus group selection process in Phase 2 restricted the ability of this study to address RQ4, which asked whether Facebook Addiction took different forms. An alternative method is therefore needed to answer this research question.

Finally, although the use of Facebook Ads was somewhat successful in reaching potential participants (990 Facebook users clicked on the Ad), it was expensive to run ($AU800) given that 97% of clickers failed to participate. Therefore, while the advertisement itself only cost $AU0.80 per click, the cost per participant was actually $AU23.50. As a result of this expense, the recruitment campaign had to be shortened considerably from the originally planned period (2 weeks). The inclusion of some free online recruitment strategies, such as posting on online discussion boards and employing a snowball technique, would allow researchers with limited budgets to advertise for longer periods of time.

Given the lack of research on Facebook Addiction and the use of online focus groups, the problems listed above were difficult to anticipate. In response to these issues, the decision was made to revise Phase 3 of the research design by conducting a similar study to Phase 2, with the above amendments in place. This new design is discussed in Chapter 8.

7.5. Summary

This chapter described the method used to conduct a primarily qualitative
exploratory study of Facebook Addiction, using an online screening survey and focus groups. These methods resulted in a data yield that was more limited than expected, but nonetheless, some interesting findings were reported. Tentative support was provided for each of the seven core symptoms of Internet Addiction, as identified from the Phase 1 systematic review. In addition, three potential additional indicators of Facebook Addiction were identified: social obligation, mood maintenance, and disconnection. These results have the capacity to advance the field of Facebook Addiction research, however, more substantial data are needed to confirm their relevance. As a result, Chapter 8 describes a larger mixed methods study, which was conducted in order to supplement the Phase 2 results.
Chapter 8
Phase 3: Method and Quantitative Results

As outlined in Chapter 5, the design for Phase 2 was influenced by the following research questions:

- **RQ2**: Assuming that Facebook Addiction exists, can the symptoms of Internet Addiction be used to identify this disorder?
- **RQ3**: Is there any indication that there are symptoms of indicators of Facebook Addiction that are unique from the common set of Internet Addiction symptoms?
- **RQ4**: Does Facebook Addiction take different forms?

The original plan was that, once answers to these questions had been found, a larger-scale follow-up study (Phase 3) would be conducted in order to address RQ5, which asked whether certain demographic or behavioural characteristics could predict the occurrence of Facebook Addiction. However, as revealed in Chapter 7, the findings from Phase 2 only provided tentative answers to RQs 2 to 4. As such, it was considered premature to proceed with the original design for Phase 3. Instead, the research design used in Phase 2 was amended, based on the limitations that were identified (see Section 7.4) and Phase 3 was revised to address RQs 2 to 5.

The revised design for Phase 3 (as introduced in Figure 5.2) consisted of three stages. The first involved concurrent collection of quantitative (closed-ended) and qualitative (open-ended) data using an online survey. The second involved qualitative data collection using an online focus group. The third and final stage involved the transformation of qualitative survey data into binary quantitative data to (a) identify potential Facebook Addicts, and (b) enable exploratory statistical analyses to be performed. The qualitative data collected during the first and second stages were used to answer RQs 2 and 3. RQs 4 and 5 were answered using the quantitative data collected in the first stage, in conjunction with the recoded qualitative data transformed during the third stage. These stages will be explained further below, and in forthcoming chapters.

As will be discussed, the methods used in Phase 3 resulted in a larger and broader dataset than in Phase 2, which allowed the subsequent data analyses to be
considerably more complex. Therefore, Phase 3 is presented over three chapters. In
the present chapter, the revised methods used for data collection are presented, as
are basic inferential statistics for the total sample. Chapter 9 provides the thematic
analysis of the qualitative data, highlighting evidence supporting the potential core
and unique symptoms of Facebook Addiction. Chapter 10 details the processes
involved with data transformation, the quantitative identification of potential Facebook
Addicts, and subsequent data analyses. In light of the changes that were made to the
Phase 2 method, the performance of the online recruitment and data collection
methods are also evaluated in the present chapter. A discussion of the limitations
across all stages of Phase 3 occurs in Chapter 11.

8.1. Method

The methods used in Phase 3 were based on those used in Phase 2
(described in Section 7.1), however, as noted in Section 7.4, those methods had a
number of limitations. For example, the wording of the Facebook Ad may have been
problematic, and the online focus group did not yield a large enough dataset to
comprehensively answer the relevant research questions. Therefore, several
amendments to the method were made. The information below focuses primarily on
these amendments.

8.1.1. Participants. Consistent with the inclusion criteria for Phase 2 (see
Section 7.1.1), participants in Phase 3 were required to be Facebook members,
adults over the age of 18, proficient in written English, and able to access the Internet
independently. In order to widen recruitment, the criteria relating to country of
residence and having concerns about Facebook use were removed. The latter
change had two advantages. First, it permitted the inclusion of individuals who were
in denial, or lacked awareness, that they were potentially addicted to Facebook.
Second, it allowed statistical comparison between individuals who appeared to be
Facebook Addicted and those who were not. As RQ5 asks whether certain variables
predict Facebook Addiction, this was an important amendment.

In regard to the inclusion criteria for the online focus groups, only one change
was made: Ireland was added to the eligible countries of residence. This was
because a large Irish online discussion board was used as a method of recruitment
(see Section 8.3.1.3). In order to ensure that all focus group participants had
concerns about their Facebook use, and would thus contribute data that was
potentially relevant to Facebook Addiction, the flow of the survey was designed so
that only participants who had mild concern or higher were invited to take part in the focus group.

Figure 8.1 shows the flow of participants through Phase 3. A total of 652 individuals responded to the online advertisements and accessed the survey. Of these, 491 started the survey, but only 461 met the inclusion criteria. Individuals completing the survey totalled 425, which is a completion rate of 92%\(^{29}\). Participants who did complete the survey, but who failed to answer all questions were excluded (\(n = 8\)). As mentioned above, two additional inclusion criteria (Facebook concern and country of residence\(^{30}\)) were included for the online focus group. Only 165 out of the 417 survey respondents met these extra inclusion criteria. Of these, 51 provided a pseudonym for the focus group, 20 registered, and nine took part.

The final sample of survey respondents ranged in age from 18 to 80 years (\(M = 31.57, SD = 9.33\)). Focus group participants were aged between 19 and 48 years (\(M = 28.44, SD = 9.06\)). Descriptive demographic data relating to sex and country of residence for survey and focus group respondents are presented in Table 8.1. As the table shows, the majority of both survey and focus group respondents were females and Australian residents. This bias is likely due to the methods of recruitment that were used (see Section 8.1.3).

8.1.2. Materials. As in Phase 2, Phase 3 involved an online survey and focus group. Each of these will be discussed in the subsections below.

8.1.2.1. Online survey. One of the main changes to the Phase 2 method was that an online survey was used as the predominant source of data collection in Phase 3 (see Appendix G). The rationale for this amendment stemmed from the fact that most participants in Phase 2 completed the survey, but did not continue on to take part in the focus group. In an attempt to collect rich and detailed survey data, a mix of open and closed-ended questions were used.

The online survey consisted of 33 items: three demographic questions, four general Facebook usage questions, 24 potential Facebook Addiction questions, and two questions related to participation in the online focus groups. Of the 24 questions designed to measure potential symptoms of Facebook Addiction, two used five-point Likert-type scale responses, nine were dichotomous closed (Yes/No) screening questions, and 13 were open-ended questions. The online survey was hosted by

\(^{29}\) A statistical comparison of the demographic differences between survey completers and non-completers is presented in Section 8.4.2.

\(^{30}\) A rationale behind the inclusion of these criteria for focus group participants was provided in Section 7.1.1.
Figure 8.1. Flow of participants through the Phase 3 research study.
Table 8.1

Frequencies (and Percentages) of Demographic Characteristics for Survey and Focus Group Respondents

<table>
<thead>
<tr>
<th>Demographic Characteristic</th>
<th>Survey</th>
<th>Focus Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( n = 417 )</td>
<td>( n = 9 )</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>131 (31)</td>
<td>2 (22)</td>
</tr>
<tr>
<td>Female</td>
<td>286 (69)</td>
<td>7 (78)</td>
</tr>
<tr>
<td>Country of Residence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Australia</td>
<td>322 (77)</td>
<td>4 (44)</td>
</tr>
<tr>
<td>Canada</td>
<td>13 (3)</td>
<td>1 (11)</td>
</tr>
<tr>
<td>Ireland</td>
<td>19 (5)</td>
<td>2 (22)</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>33 (8)</td>
<td>2 (22)</td>
</tr>
<tr>
<td>Other</td>
<td>30 (7)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>

Qualtrics (www.qualtrics.com).

The 24 potential Facebook Addiction questions were based on the nine questions from the Phase 2 survey (see Section 7.1.2.1) and the five questions from the Phase 2 focus groups (see Section 7.1.2.2). The latter were amended to encourage detailed responses. Closed questions (Yes/No) were used to establish presence of symptoms, and open-ended follow up questions were used to generate further exploration. The flow of the survey was typically configured so that the follow-up question(s) only appeared if the participant answered ‘Yes’ to the relevant screening question.

Two additional open-ended questions were added to the online survey. The new questions asked participants what they generally spent most of their time doing when they were using Facebook, and whether they had ever been told by somebody else that their Facebook use was problematic or excessive. The former question was included to gain a sense of whether certain types of Facebook activities were associated with Facebook Addiction (RQ4, see Chapter 10). The latter question was designed to (a) ascertain whether participants experienced excessive Facebook use, and (b) act as a marker for potential Facebook Addiction (in the event that participants were in denial, or lacked self-awareness on this topic).

8.1.2.2. Online focus group. A focus group was used to provide data to
supplement and extend the results from the online survey. In light of the limitations of the method used in Phase 2, two changes were made to the focus group. First, there was only one forum; this change (a) increased the potential size of this group, (b) provided more opportunities for interaction, and (c) simplified the process of joining the group. The structure of the amended discussion board forums is presented in Figure 8.2. Second, there was only one main question for participants to answer: “What is it that concerns you about your Facebook use?” This question was selected as it was one of the final questions on the online survey, so it was likely that participants would already have an answer ready to provide. It was also considered a good starting point for a discussion of Facebook Addiction.

![Figure 8.2. Structure of Phase 3 online focus group forums.](image)

As the conversation expanded, it was anticipated that the focus group moderator would ask additional questions of participants, and start new threads when important themes were raised. However, due to the low level of participation, only two additional threads were created. These asked “Do you have trouble limiting your Facebook use?” and “Do you think Facebook is addictive?”

8.1.3. Procedure. The procedure used in this phase was similar to the Phase 2 procedure described in Section 7.1.3. Potential participants clicked on the study link, which directed them to the PIS (see Appendix G). After reading through this statement, participants were required to indicate that they consented to take part in the study, and that they met the inclusion criteria related to age, Facebook use, and
proficiency in written English. They then proceeded to the survey, which was expected to take between 10 and 20 minutes to complete. At the conclusion of the survey, participants who had Facebook concerns and were residents of Ireland, or one of the five countries listed in Section 7.1.1, were invited to take part in the online focus group. As in Phase 2, it was a requirement that focus group participants provided a pseudonym as their focus group username. At that point, participants’ browsers automatically redirected to the same online discussion board used in Phase 2 (with alterations as stipulated in Section 8.1.2.2).

In Phase 3, there were three important changes to the recruitment process. First, the title of the Facebook Ad was changed from “Do you have a FB problem?” to “Do you use Facebook too much?” consistent with the removal of the inclusion criterion related to Facebook concern (see Section 8.1.1). Second, in Phase 2 of the research design, participants were offered $AU10 worth of iTunes credit in order to take part in the focus group. However, none of the Phase 2 focus group participants claimed this incentive. Due to the broadening of the recruitment strategies in Phase 3, and the shift away from the focus group as the main method of data collection, no incentive was provided. Third, although the targeted Facebook Ad used in Phase 2 was successful in reaching a large number of users, the cost associated with its use was limiting. Therefore, the advertising strategy used in Phase 2 was expanded in order to maximise the number of participants recruited to take part in Phase 3. Specifically, three other low-cost recruitment techniques were employed in conjunction with the paid Facebook Ad: a Facebook snowball sampling method, a Facebook Group, and advertising on multiple online discussion boards. More details about these three additional methods are provided below.

8.1.3.1. Facebook snowball method. Snowball sampling, which involves initial study participants referring members of their own social network to the study, is widely used by social researchers (Biernacki & Waldorf, 1981). In contrast, the Facebook snowball method is a relatively new online alternative, having only been employed in a limited number of studies (i.e., Baltar & Brunet, 2012; Bhutta, 2012; Erchull, Liss, & Lichiello, 2013). Facebook is a perfect medium for the use of the snowball method: it provides access to large social networks and facilitates information sharing. To share content on Facebook, all a user needs to do is click on the ‘Share’ link, which is immediately available on all status updates.

To execute the Facebook snowball method, the link to the online survey was posted as a status update to the author’s personal Facebook profile page. When
posting this information, the author asked her Facebook friends to consider sharing the link on their own profile. Each time the post was shared, it was exposed to a new audience who were then able to share the link again. In this way, the survey link was expected to reach many Facebook users with a snowball-like effect.

Adopting the Facebook snowball sampling method provides advantages for researchers. According to Baltar and Brunet (2012), this method can be more effective than an offline snowball method, as it leads to higher response rates. They argue that, as the researcher’s personal Facebook profile is linked to the recruitment information, other Facebook users may feel more comfortable taking part. It is also free, uses only limited resources, and is extremely easy to implement (Bhutta, 2012). Furthermore, this method of recruitment is a logical choice for studies such as this one, which seek to evaluate the behaviour and cognitions of Facebook users. One of the potential drawbacks of this method is that it can lead to biased samples. However, as this study involved purposive sampling techniques, bias was difficult to avoid.

8.3.1.2. Facebook Groups. A Facebook Group is a page based on a certain topic, which multiple Facebook users can access. It can be either private, invitation only, or publicly viewable. For the purposes of this study, a public Facebook Group was created, titled Problematic Facebook Users Study. In the information section of the group, recruitment information and links to the online survey were provided.

Bhutta (2012) was one of the first scholars to write about the use of Facebook Groups for research recruitment. She created a Facebook Group designed to recruit baptised Roman Catholics, and found it to be highly successful. In the present study, the idea behind this sampling technique was that Facebook users who searched for problematic Facebook use would find the group and be able to take part in the study. People who did this would also be able to invite other Facebook users to the group, which may lead to increased levels of participation. Like Facebook snowball sampling, it was expected that this recruitment technique would likely result in a biased sample.

8.3.1.3. Online discussion boards. Advertising for participants on online discussion boards has been a successful method of recruitment used by researchers in the past. For example, Ryan and Xenos (2011) recruited a sample of over 1300 Australian Internet users via this technique, in conjunction with a paid Facebook Ad. As with the other free recruitment methods discussed here, online discussion boards

31 As in Phase 2, the word “addiction” was not used in any recruitment material.
also have the potential to recruit a biased sample. However, this technique can be highly effective for exploratory studies.

Specific online discussion boards were selected for this study because they either had a high number of active users (i.e., more than 1000), or they were dedicated to discussion of social networking sites. For ethical reasons, permission was obtained from the discussion board moderators and/or administrators before posting the advertisements for participants. Ten discussion boards were chosen for inclusion, and information about each is presented in Table 8.2.

Table 8.2

<table>
<thead>
<tr>
<th>Board Name</th>
<th>Topic</th>
<th>Country</th>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Best Recipes</td>
<td>Cooking</td>
<td>Australia</td>
<td>280,280</td>
</tr>
<tr>
<td>Boards.ie</td>
<td>General</td>
<td>Ireland</td>
<td>630,000</td>
</tr>
<tr>
<td>Bubhub</td>
<td>Pregnancy and Parenting</td>
<td>Australia</td>
<td>25,109</td>
</tr>
<tr>
<td>Canadaka</td>
<td>General</td>
<td>Canada</td>
<td>35,247</td>
</tr>
<tr>
<td>Essential Baby</td>
<td>Pregnancy and Parenting</td>
<td>Australia</td>
<td>244,368</td>
</tr>
<tr>
<td>FasterLouder</td>
<td>Music</td>
<td>Australia</td>
<td>100,864</td>
</tr>
<tr>
<td>The Facebook Forum</td>
<td>Facebook</td>
<td>Unknown</td>
<td>2,978</td>
</tr>
<tr>
<td>The Social Networking Forum</td>
<td>Social Networking</td>
<td>Unknown</td>
<td>21,258</td>
</tr>
<tr>
<td>The Student Room</td>
<td>Education</td>
<td>UK</td>
<td>1,374,898</td>
</tr>
<tr>
<td>Whirlpool</td>
<td>Technology</td>
<td>Australia</td>
<td>617,984</td>
</tr>
</tbody>
</table>

The advertisements used for each of the three methods discussed above contained a bit.ly link to the online survey. A bit.ly link allows the creator to customise the URL, and to view analytic information about the individuals who click on the link and where they clicked from (this data is presented in Figure 8.1). The link used in Phase 3 was http://bit.ly/rmitfacebookstudy.

8.2. Data Analysis

Raw data from 652 participants (306 women and 155 men) were downloaded from Qualtrics and imported into PASW Statistics GradPack 18.0 (SPSS, 2009) for analysis. As illustrated in Figure 8.1, data from the following types of participants were removed prior to analysis: (a) those who failed to provide consent (n = 166), (b)
those who failed to indicate that they met the inclusion criteria \((n = 25)\), and (c) those who dropped out before the conclusion of the survey \((n = 36)\). Missing data was dealt with by removing the responses of participants who had failed to answer all the relevant questions \((n = 8)\). After this process, the final sample comprised 417 participants.

Open-ended survey data were imported into the qualitative data analysis software program NVivo for thematic analysis. Thematic analysis of the open-ended survey responses and the focus group responses were performed according to the guidelines provided in Section 5.5. Further information about the thematic analysis process is provided in Chapter 9, along with the results. Closed-ended survey data were initially analysed using descriptive procedures (i.e. frequencies). Data transformation then occurred in order to identify a sample of potential Facebook Addicts. Following this, cluster analysis and regression modelling took place (see Chapter 10).

### 8.3. Results and Discussion

Before the results and discussion are presented, it is important to note that the research design used in Phase 3 intentionally made use of broad recruitment and data collection methods. Due to this, the results presented below are also broad, and contain responses from participants who were most likely not Facebook Addicts. Therefore, rather than relating specifically to Facebook Addiction\(^{32}\), this section provides an insight into the descriptive statistics of a sample of individuals who felt that they use Facebook too much.

#### 8.3.1. Descriptive statistics

This subsection presents results and discussion relating to several aspects of Facebook use by the total sample: time spent on Facebook, level of Facebook use, use of Facebook on mobile devices, Facebook concerns, and socially motivated use of Facebook.

##### 8.3.1.1. Time spent on Facebook

Table 8.3 provides a comparison of Phase 2 and Phase 3 participants’ responses to the question regarding time spent on Facebook per day for non-work related purposes. In contrast to the results from Phase 2, where a high proportion of participants used Facebook between 2 and 4 hours a day, the majority of Phase 3 survey respondents (66%) spent less than 2 hours on Facebook per day. Furthermore, 26% of survey respondents in Phase 2

\(^{32}\) Data deemed to be most relevant to answering the research questions are discussed in Chapters 9 and 10.
spent more than five hours a day on Facebook, but in this sample, only 13% did. Therefore, in general, Phase 3 survey participants were lighter users of Facebook than those recruited in Phase 2. These divergent results most likely reflect changes to the inclusion criteria from Phase 2 to Phase 3, namely the removal of the criterion related to having existing concerns about Facebook use. This argument is supported by the fact that the results for Phase 3 focus group participants, who did have to meet the concern criterion, are similar to the Phase 2 sample.

Table 8.3

Frequencies (and Percentages) of Time Spent on Facebook Per Day by Phase 2 Survey Respondents, Phase 3 Survey Respondents, and Phase 3 Focus Group Respondents

<table>
<thead>
<tr>
<th>Time Spent on Facebook Per Day</th>
<th>Phase 2 Survey (N = 34)</th>
<th>Phase 3 Survey (N = 417)</th>
<th>Phase 3 Focus Group (N = 9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 minutes or less</td>
<td>1 (3)</td>
<td>101 (24)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>31-60 minutes</td>
<td>2 (6)</td>
<td>93 (22)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>1-2 hours</td>
<td>7 (21)</td>
<td>84 (20)</td>
<td>1 (11)</td>
</tr>
<tr>
<td>2-4 hours</td>
<td>15 (44)</td>
<td>88 (21)</td>
<td>4 (45)</td>
</tr>
<tr>
<td>5-6 hours</td>
<td>6 (17)</td>
<td>33 (8)</td>
<td>1 (11)</td>
</tr>
<tr>
<td>6-8 hours</td>
<td>2 (6)</td>
<td>7 (2)</td>
<td>3 (33)</td>
</tr>
<tr>
<td>More than 8 hours</td>
<td>1 (3)</td>
<td>11 (3)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>

Table 8.3 also shows that, for Phase 3 survey respondents, the distribution of responses indicating lower levels of use (up to 2-4 hours per day) is even, but becomes lower in the heavier use categories (5 hours per day or more). Therefore, for pragmatic reasons, these data were reorganised into four levels of usage: light, moderate, heavy, and very heavy. To create these categories, it was first necessary to establish cut-off points. Since there has been no other published research providing established cut-off points for levels of Facebook use in recent times, a strategy inspired by other Internet researchers was adopted. While investigating social connectivity amongst heavy, moderate, and light Internet users, Wang and Wellman (2010) classified scores that were close to the mean as moderate. Similarly, Nithya & Julius (2007) used the average Internet usage score from their sample as a clear line of demarcation; anything above this score was called heavy use, while
anything below was classified as light.

The mean score for daily Facebook use in this study was 2.80, which sits between the values of 2 (31-60 minutes) and 3 (1-2 hours). As a result, responses from participants who estimated their daily Facebook usage at anywhere between 31 minutes and two hours were placed into the moderate category. This level of use corresponds with the previously determined average level of daily use (90 minutes) discussed in Section 4.4.2. Any reported daily Facebook usage that was less than 31 minutes per day was classified as light usage, while reported daily usage that was more than two hours but less than four hours was classified as heavy usage. For the 51 participants who admitted spending upwards of 4 hours a day on Facebook, their level of usage represented a large departure from the mean. This group were therefore classified as very heavy users.

Table 8.4 presents percentages for the new level of Facebook usage categories, and a summary of data from the remaining Facebook use questions: use on mobile devices, Facebook-related concerns, and socially motivated use of Facebook. In order to explore these data further, the percentage of responses across sex and age group33 has also been provided.

8.3.1.2. Level of Facebook use. As stated above, the majority of participants in this sample (43%) were moderate Facebook users, using the site between 31 minutes and two hours per day. However, as the recruitment advertisements asked for participants who felt that they used Facebook too much, it seems that the personal experience of excessive Facebook use may not always correspond with levels suggested by researchers. Instead, it might be a condition felt by individuals in light of their own life circumstances and self-expectations. On the other hand, it may be the case that the overwhelming use of student samples by previous researchers has led to a biased view of what average daily Facebook use is. For example, students may be spending more time on Facebook per day than non-students because they have more free time to spend. A similar pattern was seen in relation to gaming addiction (Hussain et al., 2012). Therefore, this is an area that could be the focus of further research.

The trends seen in Phase 2 regarding older people spending larger amounts of time on Facebook (see Section 7.3.1.1) were not replicated here. In fact, a high proportion of young adults (those aged 18 to 23) were using Facebook heavily (32%) and very heavily (14%). Similar results were seen with regard to sex across both

33 For ease of comparison, the same age group categories used in Table 7.2 have been used here.
Table 8.4

Frequencies (and Percentages) of Facebook Usage Variables for Phase 3 Survey Respondents, Broken Down by Sex and Age Group

<table>
<thead>
<tr>
<th>Facebook Usage Variable</th>
<th>Total (N = 417)</th>
<th>Female (n = 286)</th>
<th>Male (n = 131)</th>
<th>Age Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18-23 (n = 88)</td>
</tr>
<tr>
<td><strong>Level of Use</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light</td>
<td>101 (24)</td>
<td>54 (19)</td>
<td>47 (36)</td>
<td>16 (18)</td>
</tr>
<tr>
<td>Moderate</td>
<td>177 (43)</td>
<td>122 (43)</td>
<td>55 (42)</td>
<td>32 (36)</td>
</tr>
<tr>
<td>Heavy</td>
<td>88 (21)</td>
<td>70 (24)</td>
<td>18 (14)</td>
<td>28 (32)</td>
</tr>
<tr>
<td>Very Heavy</td>
<td>51 (12)</td>
<td>40 (14)</td>
<td>11 (8)</td>
<td>12 (14)</td>
</tr>
<tr>
<td><strong>Use on Mobile Devices</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>46 (11)</td>
<td>28 (9)</td>
<td>18 (14)</td>
<td>10 (12)</td>
</tr>
<tr>
<td>Rarely</td>
<td>63 (15)</td>
<td>45 (16)</td>
<td>18 (14)</td>
<td>17 (19)</td>
</tr>
<tr>
<td>Sometimes</td>
<td>70 (17)</td>
<td>39 (14)</td>
<td>31 (23)</td>
<td>17 (19)</td>
</tr>
<tr>
<td>Often</td>
<td>238 (57)</td>
<td>174 (61)</td>
<td>64 (49)</td>
<td>44 (50)</td>
</tr>
<tr>
<td><strong>Level of Concern</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>244 (59)</td>
<td>159 (55)</td>
<td>85 (65)</td>
<td>48 (54)</td>
</tr>
<tr>
<td>Mild</td>
<td>110 (26)</td>
<td>79 (28)</td>
<td>31 (24)</td>
<td>26 (30)</td>
</tr>
<tr>
<td>Moderate</td>
<td>47 (11)</td>
<td>37 (13)</td>
<td>10 (8)</td>
<td>11 (13)</td>
</tr>
<tr>
<td>Very</td>
<td>12 (3)</td>
<td>9 (3)</td>
<td>3 (2)</td>
<td>3 (3)</td>
</tr>
<tr>
<td>Extreme</td>
<td>4 (1)</td>
<td>2 (1)</td>
<td>2 (1)</td>
<td>0 (0)</td>
</tr>
<tr>
<td><strong>Socially Motivated Use</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>13 (3)</td>
<td>11 (4)</td>
<td>2 (1)</td>
<td>2 (2)</td>
</tr>
<tr>
<td>Disagree</td>
<td>17 (4)</td>
<td>8 (3)</td>
<td>9 (7)</td>
<td>7 (8)</td>
</tr>
<tr>
<td>Neither Agree nor Disagree</td>
<td>70 (17)</td>
<td>43 (15)</td>
<td>27 (21)</td>
<td>17 (19)</td>
</tr>
<tr>
<td>Agree</td>
<td>234 (56)</td>
<td>160 (56)</td>
<td>74 (56)</td>
<td>49 (56)</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>83 (20)</td>
<td>64 (22)</td>
<td>19 (15)</td>
<td>13 (15)</td>
</tr>
</tbody>
</table>
phases; in Phase 3, a reasonably high proportion of females (38%) used Facebook for more than five hours a day, and were thus classified as heavy or very heavy users. In contrast, only 22% of males used Facebook for such long periods. This reinforces the argument (posed in Section 7.3.1.1) that females are more highly motivated than males to use Facebook heavily. In light of the focus group findings from Phase 2 (see Section 7.4.3), this may be because these individuals are more frequently socially isolated (e.g., stay at home mothers), and reliant on Facebook for their online communication. However, as this study did not explicitly examine these variables, further research is recommended.

8.3.1.3. Use of Facebook on mobile devices. Table 8.4 suggests 57% of the sample used Facebook on a mobile device often. As discussed in Section 7.3.1.2, this pattern illustrates the substantial number of individuals who choose to use Facebook on mobile devices. Interestingly, the present sample of survey respondents demonstrated a slightly higher tendency to report frequent use of mobile devices when compared to the 47% of survey respondents recorded in Phase 2 (see Table 7.3). As suggested in Chapter 7, this may be due to the fact that the sample used in Phase 2 was recruited using Facebook Ads, which only appear on the desktop version of Facebook.

In Phase 2, the results indicated that a higher proportion of women (50%) than men (19%) never or rarely used Facebook on mobile devices. Amongst the present sample, this result was not replicated. In fact, a slightly higher proportion of men (28%) answered in this way than women (25%). In light of these contrasting results, it seems that sex is not a reliable predictor of use of Facebook on mobile devices. Instead, the results shown in Table 8.4 indicate that age might be a more useful predictor; 51% of participants aged 42 and over never or rarely used Facebook in this way. This result is similar to that shown in Phase 2 (see Table 7.3), and could reflect the fact that older adults are less likely to own smartphones or tablets than younger adults (Pew Internet, 2014).

8.3.1.4. Level of concern. In regard to personal concern about Facebook use, Table 8.4 shows that the majority of participants (59%) in Phase 3 had no concern at all. This result was consistent across age and sex. In contrast, most Phase 2 participants were at least moderately concerned about their Facebook use. The difference in results between the two studies can most likely be explained by the different inclusion criteria used. Phase 2 recruited participants who were concerned about their use, whereas Phase 3 requested participants who felt that were using
Facebook too much. These results demonstrate how modification of the inclusion criteria can lead to a substantial difference in participants.

One of the main concerns that Phase 2 participants had about their Facebook use was that they were using it too much (see Table 7.4). As such, it seemed appropriate to pose the following research question:

**Research Question 6: Is level of Facebook use associated with level of concern about Facebook use?**

As a first step in answering RQ6, a contingency table was created (see Table 8.5). Due to the low proportion of participants who were very and extremely concerned about their Facebook use (see Table 8.4), seven cells (35%) had an expected count less than five. This meant that one of the assumptions of the Pearson’s chi-square was violated (Field, 2009), and that particular test could not be performed. Instead, a two-tailed Spearman’s rho correlation coefficient test was used to answer RQ6. Spearman’s test was used instead of Pearson’s test because the two variables in question collected ordinal rather than interval data (Field, 2009).

Table 8.5

**Contingency Table Depicting the Shared Frequencies (and Percentages) of Responses Between Level of Use and Level of Concern Among Phase 3 Survey Respondents (N = 417)**

<table>
<thead>
<tr>
<th>Level of Use</th>
<th>Level of Concern</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>None</td>
</tr>
<tr>
<td>Light</td>
<td>83 (82)</td>
</tr>
<tr>
<td>Moderate</td>
<td>105 (59)</td>
</tr>
<tr>
<td>Heavy</td>
<td>31 (35)</td>
</tr>
<tr>
<td>Very Heavy</td>
<td>25 (49)</td>
</tr>
</tbody>
</table>

The results of the test revealed that there was a moderately\(^{34}\) significant positive relationship between level of Facebook use and level of concern about Facebook use.

\(^{34}\) Interpretation of the value of \(r\) is based on Hopkins (2013).
Facebook use, $r_S (N = 417) = .31$, $p < .001$, $r_S^2 = .09 (.04, .14)$. As level of Facebook use increased, so too did level of concern about Facebook use. Spending large amounts of time on Facebook per day points to the possibility of addiction to the site (see Section 6.2.3.7). Furthermore, excessive use would likely lead to negative outcomes, such as the neglect of other important daily tasks (Caplan, 2005). However, as the correlation was only moderate, other variables are also likely to contribute towards the experience of Facebook concern. For instance, some Phase 2 participants tended to be concerned about the types of activities they engaged in on Facebook (i.e. repetitively checking for new content, checking up on people, and playing games), or the fact that they were reliant on Facebook to maintain their social life (see Section 7.3.2).

One trend apparent in Table 8.5 was that the majority of very heavy Facebook users had either no concern or mild concern about their Facebook usage. There are two potential explanations for this result. First, while excessive Facebook usage may be leading to negative consequences, these individuals are in denial about the seriousness of this issue. As mentioned in Section 7.3.1.3, denial of problems is an experience that is common among addicts (Gainsbury & Blaszczynski, 2012; Li et al., 2011; Sohn & Choi, 2013). Second, no negative consequences are apparent, and heavy Facebook use may be providing these very heavy users with perceived benefits (such as online social enhancement or relief from loneliness). In regards to the latter point, a similar trend has been reported among excessive online gamers (Hussain & Griffiths, 2009). These two potential alternatives deserve further attention in forthcoming chapters.

8.3.1.5. Socially motivated use. Table 8.4 illustrates that the majority of participants (76%) agreed or strongly agreed with the question “My Facebook use is motivated by a desire to be social”. This trend was consistent across age group and sex. In Phase 2, this question was asked in the focus group rather than the survey and, as such, the results cannot be compared with Phase 2 data. However, in light of the numerous uses and gratifications studies that recognise the importance of relationship maintenance as a motivator for Facebook use (see Table 4.3), the fact that most participants used Facebook for social reasons is not surprising. In regards to the 7% of participants who disagreed or strongly disagreed that their use was motivated by social reasons, Facebook use may instead be tied to entertainment gratifications or passing time. These were also common motivations associated with

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35 All confidence intervals in this thesis were set at 95%.
Facebook use (as highlighted in Section 4.4.4.1).

8.3.2. Closed-ended survey data. As described in Section 8.1.2.1, a series of dichotomous categorical (Yes/No) screening questions were included in the survey. As these questions were created as a broad screening tool, the resulting data are not deemed to be representative of Facebook Addiction. However, examination of frequency data from these questions is included here (Table 8.6) as a descriptive snapshot of elements of Facebook use.

Although the majority of participants (54%) admitted thinking about Facebook when they were not using it, this trend varied across demographic categories: women (62%), heavy (68%), and very heavy Facebook users (67%) were more likely to answer in this way. The results regarding sex suggest that Facebook may be more important to women than men, thus thoughts of using the site more frequently occur. In light of the fact that women tend to be heavier Facebook users than men (see Section 7.3.1.1), these results are unsurprising; heavier users are likely to be more invested in Facebook use than light Facebook users, therefore they would also be more likely to think about Facebook when they were not using it.

With respect to the three questions regarding moods experienced prior to using Facebook, most participants answered in the negative regardless of demographic variables. Overall, these results suggest that the experience of mood alteration is unlikely to motivate the majority of individuals to use Facebook. A similar result was found in a study of online gamers (Hussain & Griffiths, 2008): only 34% admitted that they played games in order to change their moods. As was discussed in Section 8.3.1.5, it seems that participants in the present study were more likely to use Facebook because of a desire to be social, rather than to avoid or maintain certain moods.

The majority of participants (78%) provided a response of ‘Yes’ to the question asking whether socialising on Facebook feels different to socialising in real life. Caplan’s (2010) social skill model of generalised problematic Internet use (see Section 3.4.2) might predict that Facebook Addicts would be most likely to answer in the affirmative, as they would perceive communication in the two contexts differently. For example, due to shyness or anxiety in offline social situations, Facebook Addicts might feel that Facebook communication is more comfortable, or provides them with more social control (Caplan, 2002; Davis 2001). Therefore, they may develop a preference for online social interaction (Caplan, 2010). However, it is worth noting that 39% of very heavy Facebook users felt that there was no difference between
**Table 8.6**

Frequencies (and Percentages) of Responses to Facebook Addiction Screening Questions for Phase 3 Survey Respondents, Broken Down by Sex, Age Group, and Level of Facebook Use

<table>
<thead>
<tr>
<th>Screening Question</th>
<th>Sex</th>
<th>Age Group</th>
<th>Level of Use</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>18-23</td>
<td>24-29</td>
</tr>
<tr>
<td>Do you think about FB when not using it?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>226 (54)</td>
<td>53 (51)</td>
<td>64 (59)</td>
</tr>
<tr>
<td>No</td>
<td>191 (46)</td>
<td>46 (52)</td>
<td>51 (49)</td>
</tr>
<tr>
<td>Are you generally in a particular mood when checking FB?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>111 (27)</td>
<td>29 (28)</td>
<td>31 (29)</td>
</tr>
<tr>
<td>No</td>
<td>306 (73)</td>
<td>61 (69)</td>
<td>75 (72)</td>
</tr>
<tr>
<td>Are you generally in a particular mood when updating FB status?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>175 (42)</td>
<td>38 (43)</td>
<td>44 (42)</td>
</tr>
<tr>
<td>No</td>
<td>242 (58)</td>
<td>50 (57)</td>
<td>60 (58)</td>
</tr>
<tr>
<td>Are you generally in a particular mood when using FB?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>79 (19)</td>
<td>16 (18)</td>
<td>21 (20)</td>
</tr>
<tr>
<td>No</td>
<td>338 (81)</td>
<td>72 (82)</td>
<td>83 (80)</td>
</tr>
<tr>
<td>Does socialising on FB feel different than socialising in real life?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>326 (78)</td>
<td>72 (82)</td>
<td>80 (77)</td>
</tr>
<tr>
<td>Screening Question</td>
<td>Sex</td>
<td>Age Group</td>
<td>Level of Use</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
<td>-------------</td>
<td>-----------</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td>Total N = 417</td>
<td>Male n = 131</td>
<td>Female n = 286</td>
</tr>
<tr>
<td>Have you ever been in a situation where you couldn’t or didn’t access FB for a long period of time?</td>
<td>Yes 284 (68)</td>
<td>94 (77)</td>
<td>190 (66)</td>
</tr>
<tr>
<td></td>
<td>No 133 (32)</td>
<td>28 (23)</td>
<td>96 (34)</td>
</tr>
<tr>
<td>Can you think of any instances when your FB use interfered with your normal daily activities?</td>
<td>Yes 237 (57)</td>
<td>61 (47)</td>
<td>176 (62)</td>
</tr>
<tr>
<td></td>
<td>No 180 (43)</td>
<td>70 (53)</td>
<td>110 (38)</td>
</tr>
<tr>
<td>Can you think of any instances when your FB use has caused problems with your personal relationships?</td>
<td>Yes 134 (32)</td>
<td>108 (38)</td>
<td>26 (20)</td>
</tr>
<tr>
<td></td>
<td>No 283 (68)</td>
<td>178 (62)</td>
<td>105 (80)</td>
</tr>
<tr>
<td>Have you ever been told by someone that you spend too much time using FB, or that you use FB problematically?</td>
<td>Yes 92 (22)</td>
<td>78 (11)</td>
<td>14 (27)</td>
</tr>
<tr>
<td></td>
<td>No 325 (78)</td>
<td>208 (89)</td>
<td>117 (73)</td>
</tr>
</tbody>
</table>
socialising on Facebook and socialising offline. In contrast, only 16% of light users felt this way. These results suggest that some very heavy users do not distinguish between Facebook socialising and offline socialising. Looking back at the qualitative findings of Phase 2, it seems that there may be support for this result. For example, Participant 3 (who spent 12-16 hours per day on Facebook) felt as if status updates should be responded to in the same way as offline statements made directly to friends (see Section 7.3.3.7). This attitude may be a unique indicator of Facebook Addiction; therefore, it could be a useful focus of future research.

Table 8.6 shows that the majority of participants (68%) had been in a situation where they could not access Facebook for a long period of time. However, comparing demographic variables, a slightly higher proportion of 36-41 year olds (45%) answered ‘No’ to this question than the other age ranges (23% - 37%). The same could be said for very heavy Facebook users (45%), when compared with the other levels of use (21% - 35%). In interpreting the latter results, it is logical to assume that light Facebook users would be more likely to have stopped using Facebook for a substantial period of time than heavier users, as light users are less likely to be bothered by an absence of the site. In regards to the result relating to 36-41 years olds, the interpretation is less clear. One possibility is that this age group is more likely to have the means to remain constantly connected to Facebook (e.g., availability of Internet connection and mobile devices) than younger users, but further research is needed to confirm this.

Facebook had interfered with daily activities for more than half the participants (57%). The results also indicated that people who spend more time on Facebook each day (i.e. women, younger users, and heavy users) were more likely to experience interference with their daily activities. This supports previous findings in a Malaysian sample of university students (Zaremohzzabieh et al., 2014).

The majority of participants (68%) had not experienced problems with personal relationships due to Facebook use. However, this trend changed as a result of level of Facebook use: 49% of heavy users and 45% of very heavy users answered ‘Yes’ to this question, as opposed to 19% of light users. Again, these results indicate that heavy Facebook use is linked to negative consequences. When asked whether someone had ever told them that their Facebook use was excessive or problematic, a large proportion of the sample (78%) responded ‘No’. As expected, the groups with the highest agreement were heavy (39%) and very heavy Facebook users (43%).
8.4. Evaluation of Methods

This section evaluates the methods used in Phase 3. Such a discussion is important, given that the methods described within this chapter were employed to redress the limitations of Phase 2. Furthermore, the development of useful methods for conducting mixed methods research online is an area that is currently under-reported (Hesse-Biber & Griffin, 2013). Therefore, the outcomes discussed in this chapter could be relevant to researchers interested in conducting online mixed methods research.

8.4.1. Methods of recruitment. In regards to the performance of the paid Facebook Ad, the entire five-day campaign cost $AU476. This level of expenditure allowed the advertisement to be displayed on the profile pages of 827,517 users. However, as demonstrated in Figure 8.1, only 584 Facebook users clicked on the Ad. This means that the cost of each click was $AU0.82. Unfortunately, there was no way to ascertain how many individuals recruited using the Facebook Ad actually took part in the study. This absence of information makes it impossible to calculate the cost of each retained participant in the study, and compare with the cost outlaid in Phase 2 (see Section 7.4).

An alternative method of evaluating the value of the Facebook Ad is to compare its performance with that of the free methods of recruitment. As shown in Figure 8.1, the combined number of clicks from the Facebook Group, Facebook snowball method, online discussion boards, and link-sharing was 523 clicks. This amounts to 61 clicks less than received from the Facebook Ad. Given that there were no outgoing financial costs associated with the use of these methods, there is a clear argument that these alternative methods are more economically viable for researchers with a limited budget. However, for researchers with a bigger budget, Facebook Ads may provide a better option.

Figure 8.3 provides a graphical comparison of clicks on the Facebook Ad (as provided by Facebook) and clicks from the free methods of recruitment (as provided by bit.ly analytics) over the 5-day period of the Facebook Ad campaign. As all recruitment began on the same day, this is a true comparison of the performance of paid and free methods of recruitment. As can be seen, on Day 2 and Day 3, the free sources actually outperformed the paid Facebook Ad. However, on Day 4, the Facebook Ad brought in a much higher number of clicks. This occurred because the daily spend limit on the Facebook Ad was raised on that day. The consequence of raising the daily spend limit is that the paid advertisement had a greater reach among
Facebook users. This graph therefore demonstrates how the performance of a Facebook Ad is tied to daily expenditure. For this reason, Facebook Ads could be useful for recruitment in studies where time is restrained.

Figure 8.3. Number of clicks on paid and free advertisements during five days of recruitment.

By Day 5, the performance of the free methods had dropped off substantially. This suggests that these methods have a limited life span; therefore it is necessary to monitor performance over time. For instance, when posting an advertisement on a busy discussion board, it is likely that the post will be pushed off the front page quickly due to frequent interactions in other threads. If this occurs, it may be appropriate to repost in the thread, in order to “bump” the topic back up to the top of the page. Likewise, when using the Facebook snowball method, it may be necessary to reshare the link occasionally.

8.4.2. Survey recruitment and retention. As shown in Figure 8.1, 1107 Internet users accessed the survey through Facebook, online discussion boards, and
link sharing. Of these, 58% failed to enter the survey and another 10% dropped out before finishing the survey. Although the majority of individuals either elected not to participate in the study or dropped out, a completion rate of 32% is a considerable improvement on the participant yield in Phase 2, where 96% of participants dropped out between clicking on the Facebook Ad and starting the survey. Therefore, the amendments to the methods used in Phase 3 were successful in increasing participant retention.

Of the 486 individuals who gave their consent to participate, 90% completed the survey (see Figure 8.1). This was a less successful result than in Phase 2, where 100% of people who gave consent completed the survey. This 10% reduction in completion rates can most likely be explained by the differences in length between the two surveys used (Fan & Yan, 2010); the Phase 2 survey was short and straightforward, while the Phase 3 survey was longer and more detailed. Nevertheless, a 90% completion rate was a good outcome. This may represent a high level of interest in the topic among survey respondents (Fan & Yan, 2010).

In order to ascertain whether there were any particular demographic variables associated with survey completion, a comparison of completers ($n = 425$) and non-completers (participants who dropped out after giving consent and entering the survey; $n = 36$) was performed. Non-completers had a mean age of 29.33 years ($SD = 8.63$), and the majority were male (61.1%) and residents of Australia (88.9%). Completers had a mean age of 31.64 years ($SD = 9.38$), and the majority were female (68.7%), and residents of Australia (77.4%).

A Pearson chi-square test for independence (with Yates continuity correction) indicated that there was a significant association between sex and likelihood of dropping out, $\chi^2 (1, N = 461) = 11.92, p < .001, \phi = 0.17$. Calculation of the odds ratio indicated that men were 3.45 times more likely to drop out than women, and this most likely influenced the significant result. In regards to age, a two-tailed independent samples $t$-test revealed that there was no significant difference between completers and non-completers, $t (459) = 1.43, p = .15$. A chi-square test for independence could not be performed for country of residence, as seven cells had expected counts less than five (Field, 2009).

The above results suggest that it may be harder to retain male participants when using online surveys. This is a concerning result, given that the rates of participation in research studies are often skewed towards women (Patel, Doku, & Tennakoon, 2003). One explanation for this trend is that women may be more likely
than men to feel comfortable discussing mental health issues. On the other hand, it may be the case that women may have been more likely to meet the inclusion criteria for this study. Previous research has shown that women are heavier Facebook users than men (Kittering et al., 2012; Thompson & Lougheed, 2012), thus they may have been more inclined to take part in a study asking for participants who spend too much time on Facebook. Unfortunately, there have been few similar studies with which to support this assertion. However, a survey study that used Facebook to recruit cigarette smokers reported that 72% of survey completers were men (Ramo & Prochaska, 2012). These results show that using online recruitment for survey studies does not always result in samples skewed towards women.

8.4.3. Focus group retention. As demonstrated in Figure 8.1, 165 participants met the focus group inclusion criteria and were invited to take part, but only nine (6%) of these participants did so. Focus groups tend to involve a greater investment of participants’ time than surveys, and require them to interact directly with the researcher and other participants. This may just be a step too far outside the comfort zone of the average online participant. Nevertheless nine participants is an appropriate number to include in a face-to-face focus group, as discussed in Section 5.4.2.3 (Bender & Ewbank, 1994).

In terms of the results obtained from the focus group, nine responses were received in the first topic (“What concerns you about your Facebook use?”), six were received in the second (“Do you have trouble limiting your Facebook use?”), and five were received in the third (Do you think Facebook is addictive?”). Figure 8.4 displays the number of responses across all topics for each of the nine focus group participants. As can be seen, three participants gave only one response, and the highest number of responses received from a single participant was five. The average number of responses per person was 2.3.

Overall, the results from Phases 2 and 3 indicate that it can be difficult to motivate participants to engage in online focus groups. As mentioned in Section 5.4.2.3, this specific disadvantage has been noted by other researchers (i.e., Schneider et al., 2002). In this particular study, one of the contributing factors to the lack of engagement may have been the fact that focus group participants were anonymous to the researcher. As Kraut et al. (2002b) have argued, anonymity can cause individuals to invest less energy and time than they would in offline research.

36 Thematic analysis of these responses is provided in Chapter 9.
37 As in Phase 2, the pseudonyms of focus group participants were removed and unique identifiers were used.
studies. Furthermore, participant anonymity made it challenging to remind individuals to return to the focus group regularly. This limitation could be avoided by obtaining participants’ email addresses, so that researchers can send direct messages to their email account. Alternatively, performing individual online interviews may be more a more successful method than using online discussion boards. In contrast to the online discussion board, an interview would deliver questions and responses directly to participants. The use of interviews would also avoid the potential problem of participants feeling hesitant to provide personal disclosures to a group of strangers.

Although the frequency of responses in the focus group was low, in many cases the quality of the data was richer than that received in the online survey. Table 8.7 compares an open-ended survey question response and a focus group question response to the question ‘What is it that concerns you about your Facebook use?’ When the two types of responses are compared, it is clear that each participant has given extra detail in their focus group response reinforcing the added detail that can be generated in focus groups compared to open-ended survey questions, even in online settings.
Table 8.7

Comparison of Open-Ended Survey and Focus Group Responses to the Question “What concerns you about your Facebook use?”

<table>
<thead>
<tr>
<th>Identifier</th>
<th>Survey Response</th>
<th>Focus Group Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 2</td>
<td>I spend way too much time on it and would love to be able to step back.</td>
<td>It’s very much a timewaster and distraction. I can easily go for hours in front of FB and not realize. So my biggest concern would be the amount of time spent on Facebook.</td>
</tr>
<tr>
<td>Participant 6</td>
<td>I know I spend a lot of time on it, more than I need to. I would probably be more productive in other areas of life if I wasn’t always on Facebook.</td>
<td>I do get concerned about how distracted I get by Facebook. Often I log in saying to myself that it’s just a 5 minute check, but I mess around for an hour or longer. Chatting, playing games, it’s so easy to waste time. I know I could be more productive if I didn’t have Facebook.</td>
</tr>
<tr>
<td>Participant 9</td>
<td>I should be spending more time studying and concentrating on other things but get distracted by Facebook</td>
<td>How easily distracted I am from things that I should be doing. I often will not get immersed in my studies because I’m checking my Facebook or chatting with friends.</td>
</tr>
</tbody>
</table>

8.5. Summary

The purpose of this chapter was to describe the methods used to conduct Phase 3, and provide a picture of the data obtained from the total sample. These data highlighted various associations between demographic variables and characteristics related to Facebook usage. In particular, women and young adults were more likely to be heavy or very heavy Facebook users. In addition, a significant positive relationship was found between heavy Facebook use and greater levels of concern about Facebook use.

In regards to the potential symptoms of Facebook Addiction, some interesting points were raised. For example, while mood alteration is an important component of Internet Addiction (see Section 6.2.3.5), the data presented here suggests it might be less germane to the development of Facebook Addiction. In addition, it was posited that some Facebook Addicts might feel as though socialising on Facebook is the same as socialising in real life; a position that contradicts the symptom of online social enhancement (see Section 6.2.3.3). However, as explained at the beginning of this chapter, the data discussed here stems from the total sample and is not considered to be entirely indicative of Facebook Addiction. Further refining of the
data will occur in forthcoming chapters, which will help to answer the remaining research questions.

The present chapter also offered an evaluation of the revised method used in Phase 3. In general, the amendments led to a much larger sample of participants, which was a desirable outcome. Nevertheless, the online focus group still led to a restricted dataset. It was concluded that the success of online focus groups can be limited, and careful planning should precede their use. For this particular study, online interviews may have been a more judicious choice.
This chapter presents the thematic analysis of qualitative data from the Phase 3 survey and focus group. The aim of this analysis was twofold. First, it set out to answer RQ2 by presenting evidence of the seven potential Facebook Addiction symptoms: preoccupation, mood alteration, online social enhancement, withdrawal, negative consequences, excessive use, and loss of control. Second, it sought to address RQ3 by looking for additional evidence of the potentially unique indicators or symptoms of Facebook Addiction discussed in Phase 2: social obligation, mood maintenance, and disconnection. Section 9.1 discusses the process used to perform thematic analysis. This is followed by two separate results and discussion sections: Section 9.2 focuses on themes relating to the seven potential symptoms of Facebook Addiction, while Section 9.3 concentrates on potentially unique indicators of Facebook Addiction.

9.1. Data Analysis

As noted in Section 8.2, open-ended data from the survey and focus group were imported into NVivo for thematic analysis. This analysis was performed according to the guidelines presented in Section 5.5. The first step in the analysis was to code the responses from each open-ended question (from both the survey and focus group) into broad themes. There were no a priori themes used for this initial process, instead themes were allowed to emerge naturally. Following this, the range of broad themes was examined. Themes that seemed to fit within any of the seven potential symptoms of Facebook Addiction were retained for further analysis. In addition, themes that did not specifically adhere to the seven symptoms, but were potentially related to Facebook Addiction were also retained. The latter process was guided by inductive reasoning. Themes that were considered to be irrelevant to Facebook Addiction were excluded at this point.

All of the responses in the retained themes were then pooled and recoded using the definitions of the seven symptoms (see Section 7.3.3) as a priori guidelines. Within each of these seven symptoms, several themes emerged. Those that fitted within the definition of the particular symptom were considered as themes within that symptom. Responses that were not strictly encapsulated by the definitions
of the seven potential Facebook Addiction symptoms were pooled, and recoded using the three potentially unique symptoms of Facebook Addiction (see Section 7.3.3.7) as a priori guidelines. Responses that did not seem to fit within these symptoms were separated out and recoded again. In cases where themes emerged within these responses, these were considered as additional potentially unique indicators of Facebook Addiction (discussed in Section 9.3).

9.2. Thematic Analysis of Potential Facebook Addiction Symptoms

This section examines qualitative data reflecting the seven potential core symptoms of Facebook Addiction. Table 9.1 displays the frequencies and percentages of survey respondents\textsuperscript{38} who provided responses indicative of the seven proposed symptoms. As can be seen, the majority of participants’ responses tapped in to negative consequences and preoccupation, while the other five symptoms were less frequently endorsed. The wording of the open-ended questions relating to negative consequences and preoccupation were more direct than the other questions, and this may have influenced the frequency of responses for each symptom.

Table 9.1

\textit{Frequencies and Percentages of Respondents Providing Responses Corresponding with the Seven Potential Symptoms of Facebook Addiction}

<table>
<thead>
<tr>
<th>Symptom</th>
<th>( n )</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative consequences</td>
<td>275</td>
<td>66</td>
</tr>
<tr>
<td>Preoccupation</td>
<td>225</td>
<td>54</td>
</tr>
<tr>
<td>Excessive use</td>
<td>85</td>
<td>20</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>81</td>
<td>19</td>
</tr>
<tr>
<td>Mood alteration</td>
<td>81</td>
<td>19</td>
</tr>
<tr>
<td>Online social enhancement</td>
<td>63</td>
<td>15</td>
</tr>
<tr>
<td>Loss of Control</td>
<td>24</td>
<td>6</td>
</tr>
</tbody>
</table>

\textsuperscript{38} As the focus group did not address all seven symptoms, frequency and percentage data for that sample is not provided.
Multiple themes emerged in the majority of the symptoms listed in Table 9.1. A coding tree illustrating these themes is displayed in Figure 9.1. As shown, the themes that emerged from some symptoms (i.e., negative consequences, preoccupation) included a number of subthemes. This demonstrates that the data relating to these themes were more complex and multi-faceted than others.

Each of the themes illustrated in Figure 9.1 are discussed below. Quotes are provided to support the relevance of each proposed theme. For each quote, the following basic demographic information about the participant is provided: sex, age, level of Facebook use. As the majority of data were collected using the survey, a large proportion of the quotes presented in this section were derived from this method of data collection. Where focus group responses are included, this is noted.

9.2.1. Negative consequences. A large number of participants admitted experiencing negative consequences because of Facebook use. The responses were classified into two main themes: instances where Facebook use had interfered with the commencement or completion of important daily activities, and instances where Facebook use had intruded in or caused problems in personal relationships.

9.2.1.1. Interference with daily activities. There were three main subthemes evident in the data coded into this theme. These related to interference with education, work, and other important activities. Similar themes also emerged in a previous qualitative study of Facebook Addiction (Zaremohzzabieh et al., 2014).

Many participants made reference to the fact that Facebook use had interfered with their educational pursuits. These people admitted using Facebook when they were meant to be studying, concentrating in class, or completing coursework:

[I was] browsing Facebook in college during the run-up to exams when I should [have been] studying.” (Male, 19, Light)

“I’m in the third year of a uni degree and I would constantly check Facebook when I was supposed to be doing uni work.” (Female, 29, Moderate)

“I have used [Facebook] numerous times during lectures that are boring and found most of my peers were also doing this.” (Male, 18, Heavy)

There were two common types of responses throughout this subtheme. First, several participants acknowledged that they used Facebook to procrastinate:

“Revising for uni exams, I often look at Facebook to procrastinate/use it as a

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See Section 8.3.1 for descriptive information about Facebook usage categories.
**Negative Consequences**

*Interference with daily activities*
- Education
- Work
- Chores

*Problems with relationships*
- Romantic relationships
- Children
- Social

**Preoccupation**

*Checking for new content*
- Updates
- Notifications

*Adding content*
- Status updates
- Photos
- Messages
- Check-ins
- Links

*Games*

**Excessive use**

**Withdrawal**

*Unpleasant feelings*
- Trouble staying away

**Mood alteration**

*Loneliness*
*Unhappiness*

**Online social enhancement**

*Socialising on Facebook is easier*
*Facebook socialising offers more social control*
*Reliance on Facebook socialisation*

**Loss of control**

*Spending longer than intended*
*Trouble limiting use*
*Addiction*

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*Figure 9.1. Coding tree illustrating symptoms, themes, and subthemes that emerged in the thematic analysis.*
break.” (Female, 19, Moderate)

“Facebook is a fantastic procrastination tool! I would often check Facebook instead of doing my university assignments.” (Female, 27, Moderate)

The second common type of response was that Facebook is a major source of distraction. Several participants spoke about this in relation to educational activities:

“[When] completing assignments it can easily distract me as I can endlessly browse and read things as Facebook is constantly updated.” (Male, 18, Heavy)

“Every time I’ve got college work to do I’m constantly distracting myself with Facebook.” (Female, 32, Very Heavy)

Others spoke about how they may have just intended to check Facebook quickly, but they easily end up losing track of time (potentially indicating loss of control):

“It often happens when I am supposed to be working on an assignment or studying (like now). I will say to myself “I’ll just check Facebook” and an hour later I’m still on it.” (Female, 33, Heavy)

“I am writing my master thesis about brands on Facebook, so I have to browse on it a lot just for the purposes of research. It happened many times that I logged on in order to check something related to my research but instead got caught up in my news feed and even forgot why I logged on in the first place.” (Female, 22, Moderate)

In regards to work-related interference, a large proportion of participants admitted that they used Facebook at work:

“When I am meant to be working on the computer I constantly have Facebook open in the background and find myself regularly checking for notifications.” (Female, 24, Very Heavy)

“At work I often go to the toilet just to look at Facebook on my iPhone. My work is very dull and repetitive however.” (Male, 32, Moderate)

One participant revealed that they had downloaded software to help stop them checking Facebook at work:

“[I check Facebook] every day at work. I have downloaded browser blockers like Leechblock before to help remind me NOT to check Facebook.” (Female, 29, Moderate)

None of these participants indicated that their Facebook use had caused negative ramifications at work, however one participant admitted that they thought they were about to be reprimanded due to their excessive Facebook use at work:
“At work I am certain I’m about to get a warning.” (Female, 32, Heavy)

Another acknowledged that they had been late to work because they were using Facebook:

“A quick check in the morning will make me late for work.” (Female, 28, Very Heavy)

As with the education subtheme above, some participants also mentioned using Facebook to procrastinate from their work:

“When I get tired of work, I use Facebook.” (Male, 25, Light)

“[It’s] very easy to procrastinate when working from home.” (Female, 32, Moderate)

In addition, a high proportion of participants mentioned that Facebook is a source of distraction while they are at work:

“[I am] often distracted by Facebook when I should be working.” (Female, 37, Very Heavy)

“Often when I open a webpage at work, I can’t stop myself going to Facebook first up, then looking up whatever I went online for. It’s distracting and time-consuming.” (Female, 23, Moderate)

The comment above demonstrates how some individuals have trouble limiting their use of Facebook, which is indicative of loss of control (see Section 9.2.7.2). As shown here, this can potentially lead to negative consequences.

In regards to interference with other important activities, some participants made general comments, such as:

“In the evening, once I sit and get on Facebook, it is really hard to get motivated to do ANYTHING ELSE.” (Female, 28, Very Heavy)

“There are so many other things I should be doing when I’m reading Facebook.” (Female, 39, Moderate)

However, the majority of participants with comments within this subtheme referred explicitly to housework. These responses were generally made by women, and indicated that Facebook was used as a form of distraction or procrastination:

“I sometimes skimp on doing housework, and/or just do the minimum to spend time on Facebook.” (Female, 48, Very Heavy)
“It's very good for distracting me from housework!” (Female, 48, Very Heavy)

While none of the Phase 2 focus group participants noted that Facebook use had interfered with their ability to work or study, as shown above, these subthemes were strong in Phase 3. In Section 7.3.3.1, it was postulated that these kinds of comments were lacking in Phase 2 because focus group respondents were neither employed nor studying. However, this is difficult to prove without detailed demographic data.

In terms of Facebook use interfering with the ability to complete chores or other important daily activities, evidence was shown in both phases. In general, it seems as though Facebook is commonly used as a tool to procrastinate or distract from important tasks. If this behaviour becomes reinforced, it is possible that it may be linked to addiction. This possibility will be explored in forthcoming chapters.

9.2.1.2. Problems with relationships. Previously, Elphinston and Noller (2011) reported that intrusive Facebook use could be associated with problems in romantic relationships. In support of this finding, the most common types of responses relating to problems with personal relationships indicated that participants’ romantic partners were bothered by them spending too much time on Facebook, or using Facebook during time that could have been spent together:

“My partner hates me using it because it means I’m not paying him attention.” (Female, 30, Moderate)

“My husband got very frustrated with the amount of time I was spending on Facebook, and asked me to cut back. I deactivated it when I realised I actually couldn’t make myself stop checking it” (Female, 28, Moderate)

As pointed out in Section 7.3.3.1, a similar comment was made by Participant 3 in the Phase 2 focus group.

Some participants recognised that their Facebook use had caused them to be less attentive to their children:

“I was playing [Facebook Games] so much that my 12 year old daughter felt I was becoming withdrawn from her” (Female, 35, Moderate)

“I ignored my daughter for an hour [because of using Facebook]” (Female, 18, Heavy)

“Playing on Facebook has regularly caused me to be late getting to places, included taking my children to school” (Female, 39, Very Heavy)

It is worth noting that women made the majority of the responses coded into this subtheme. In fact, only one man mentioned that Facebook use had impacted on his
personal relationships, but he recognised that his behaviour was problematic after seeking therapy:

“I started to see a therapist who made me realise the frequency at which I was using Facebook and how I was failing to actually connect with people in reality. Sometimes I would be more interested in browsing Facebook than talking to my wife or family. It was not healthy.” (Male, 29, Light)

Some participants also noted that Facebook use interfered with their level of engagement in social situations:

“I always tend to check Facebook when I am out socialising” (Female, 25, Very Heavy)

“Deciding to check it remotely using the phone whilst out at parties” (Male, 22, Very Heavy)

Others recognised that they were being rude to the people in their company, but they still checked Facebook anyway:

“I find myself checking Facebook when I’m visiting friends, or out to lunch. I think it’s quite rude really yet I continue to do it!” (Female, 26, Very Heavy)

“Sometimes when I’m in company I find myself on Facebook. My manners are appalling because of Facebook and my need to know what’s happening on it.” (Female, 32, Very Heavy)

One participant revealed that they avoided social situations in favour of checking Facebook:

“Instead of meeting co-workers from work for lunch, [I go] off and [check] Facebook messages on my phone” (Male, 46, Very Heavy)

The quotes above demonstrate how some individuals can be aware that their Facebook checking behaviour is inappropriate, but they feel unable to control themselves. Again, such examples are indicative of loss of control, which will be discussed in Section 9.2.7.

In Phase 2, one of the focus group participants (Participant 1) mentioned that using Facebook had resulted in her limiting her offline communication with friends, simply because she already knew what was going on in their lives (see Section 7.3.3.1). Similar comments were also made by Phase 3 participants:

“It begins to take over from real life. You stop contacting people via phone and
catch ups because you can see their whole lives updated on facebook.” (Female, 35, Moderate)

“It has stopped me from talking to people in real life because I feel as though I have interacted with them through facebook.” (Female, 19, Heavy)

All of the above responses demonstrate that it is not unusual for Facebook use to interfere with or cause problems in users’ lives. However, there was not a great deal of evidence to demonstrate that these issues are severely detrimental to individuals. For example, none of the participants mentioned that their Facebook use was responsible for them failing a class, losing a job, or ending a relationship. This may have been because there were no actual instances of this occurring, or simply because the wording of the survey questions was too broad. While media reports suggest that intense Facebook use can lead to severe negative consequences, such as depression (Aruna, 2012) and suicide (India Today Online, 2014), more empirical evidence is still required to confirm that these are legitimate outcomes of Facebook Addiction.

9.2.2. Preoccupation. In order to collect data related to preoccupation with Facebook, participants were asked whether they had thoughts about Facebook when they were not using it. In the context of this study, thoughts about using Facebook, or planning the next time Facebook use would occur were coded as indicative of preoccupation. Three main themes emerged: thoughts about checking for new content, thoughts about adding content, and thoughts about playing games. These three themes also arose in the data from Phase 2; checking for new content and playing games emerged in the survey data (when participants were asked what concerned them about their Facebook use; see Section 7.3.2), and all three themes emerged in the focus group data (when potentially addicted participants were asked about their Facebook-related thoughts; see Section 7.3.3.3). The additional evidence that emerged in Phase 3 is examined below.

9.2.2.1 Checking for new content. One of the strongest themes in the data was that participants thought about checking Facebook for new content. A high proportion of the responses suggested that most individuals were interested in whether anything new had occurred on Facebook since the last time they checked it. The following quotes demonstrate these kinds of thoughts:

“I wonder what’s going on on Facebook.” (Female, 27, Heavy)

“Think about logging in to check what is “going on.” (Male, 20, Moderate)
As the quotes above are quite general, it is difficult to know exactly which aspect of Facebook use these respondents were thinking about. However, in some cases, it is likely that these thoughts led to actual Facebook checking behaviour. In fact, even though participants were not directly asked about this, some respondents indicated that this was the case. For example:

“[I think that I] should check Facebook, then I usually do check it.” (Female, 29, Heavy)

It is possible that thoughts about checking Facebook could become reoccurring and compulsive, as illustrated in the following quotes:

“Usually the thoughts occur as an urge to check Facebook even if I have done so recently.” (Male, 19, Moderate)

“I feel compelled to check it fairly often when I have nothing better to do.” (Female, 29, Heavy)

The above responses indicate that a cycle of Facebook related thoughts and Facebook checking behaviour could manifest in some users. It is possible that this cycle could be triggered by the fact that looking at new content on Facebook provides escape from an unwanted mood state (considered further in Section 9.2.5). This process can be explained by expectancy outcome theory, which states that individuals will perform a particular behaviour in anticipation of a reinforcing effect (Jones, Corbin, & Fromme, 2001). Reinforcement of this behaviour could theoretically arise due to a variable-ratio schedule, which occurs when a reinforcer is provided after a random number of responses or behaviours (Schoenfeld, Cumming, & Hearst, 1956). This is the same type of reinforcement seen in Gambling Disorder (Committee on the Social and Economic Impact of Pathological Gambling et al., 1999). The following quotes are suggestive of variable-ratio schedule of reinforcement for checking Facebook:

“I keep clicking in [to Facebook] even though often there is nothing interesting to read or see there… even when I find my Facebook newsfeed boring, instead of just leaving it alone, I keep looking for something interesting.” (Female, 27, Moderate)

“I find myself logging in multiple times a day (sometimes nearly a dozen) just to ‘check in’. I even do this late at night when I know there will be no updates since the last time I checked (usually less than an hour before).” (Male, 19, Moderate)
Some participants acknowledged that they felt irritation when they checked Facebook, but did not received reinforcement (in the form of new updates):

“I log on to facebook as a force of habit when I use my laptop or phone. I get frustrated when there is not a lot going on on facebook or I do not have many notifications.” (Female, 19, Heavy)

“I am on facebook several times a day and get a little peeved when there are no status updates since last login.” (Female, 28, Moderate)

A small group of participants indicated that they thought about notifications when they were not using Facebook. Two types of notifications were most frequently mentioned: comments and messages. In relation to comments, participants generally noted that they had recently posted a status update, photo, or some other type of content, and they were expecting to receive comments or ‘likes’ as a result of this. The following quotes provide some examples of this trend:

“I think about whether people are commenting on my posts.” (Female, 32, Moderate)

“I think about whether someone [has] liked or commented on my witty status update or comment.” (Male, 28, Moderate)

In regards to anticipating messages, participants referred to thinking about whether they had received a message from another user, or a response to a message they had sent themselves:

“Mostly wondering if someone has replied to one of my messages yet.” (Female, 25, Moderate)

“I wonder if others have sent me a message…” (Female, 28, Light)

In Phase 2, Participants 2 and 3 reported having similar kinds of thoughts to those above (see Section 7.3.3.3). As those particular participants did seem to be experiencing some kind of Facebook Addiction, it is possible that cognitions of this kind are forms of preoccupation. In support of this, some Phase 3 participants indicated that Facebook-related thoughts increased when content was posted:

“When I have posted a status, I often think during the day about what sort of responses I have.” (Male, 38, Moderate)

“If I have recently posted something I think about checking it more often.” (Female, 29, Moderate)
In these situations, the anticipation or expectation of receiving notifications on Facebook may lead to more frequent checking and heavier levels of use. If a notification is received, reinforcement of the posting behaviour could occur. For instance, the following survey respondent remarked:

“I was constantly updating [Facebook] to see the comments/likes.” (Female, 29, Moderate)

The following quote suggests that this reinforcement might also occur due to variable-ratio scheduling:

“I get frustrated when [I log into Facebook and] I do not have many notifications.” (Female, 19, Heavy)

9.2.2.2. Adding content. The second strongest preoccupation theme related to thoughts about adding content on Facebook. Most of the quotes coded within this theme mentioned thoughts about posting status updates:

“I sometimes think [of] Facebook status updates in my head when I’m doing things.” (Female, 25, Heavy)

“I think about witty status updates that I might like to share.” (Female, 31, Moderate)

While the act of thinking of a potential status update does not immediately point to preoccupation, it might if these thoughts become recurrent and intrusive. For example, Participant 3 from the Phase 2 focus group stated that she had trouble getting to sleep at night because she was constantly thinking about status updates (see Section 7.3.3.3). While none of the survey or focus group responses in Phase 3 suggested a similar level of preoccupation, this might again be a function of the broadness of the questioning. In fact, as discussed above (Section 9.2.2.1), it may be the case that some individuals are highly motivated to post status updates, as they are seeking social contact from their friends.

During the process of coding responses for this particular theme, it became apparent that only female participants mentioned thinking about updating their statuses on Facebook. In light of this trend, it may be the case that women are more likely to use this particular Facebook feature than men. In the context of previous research into gender differences in the use of social networking sites, this finding is not surprising. For example, Sheldon (2009) found that women were more likely to use Facebook to maintain existing relationships than men. Furthermore, Thompson
and Lougheed (2012) discovered that women were more likely than men to believe that they could express their feelings more easily on Facebook. Further research should examine the relationship between sex and preoccupation with posting status updates.

Apart from thoughts about posting status updates, several other types of activities were on the minds of some participants, such as posting photos, making contact with friends, ‘checking in’ at places, and sharing interesting content. All of these activities could also lead to the receipt of notifications from friends, and could thus be activities that become reinforced due to outcome expectancies.

9.2.2.3. Playing games. A small number of quotes related to thoughts about playing games on Facebook. For example:

"Thinking about latest scrabble tournament." (Female, 48, Very Heavy)

"Thinking about the next steps in the game I’m playing." (Male, 40, Moderate)

Several other references were more specific, and indicated that participants thought about how long they had to wait before returning to use a particular game:

"How long before I can go back into a certain game and collect a reward."
(Female, 24, Heavy)

"I think about whether the coins in the game I play will have been refilled."
(Female, 39, Very Heavy)

In cases where individuals become addicted to playing Facebook games, the forced act of waiting for a certain amount of time before using them again could potentially increase levels of preoccupation. As previously mentioned, it is important to distinguish whether addiction to Facebook games is a form of Facebook Addiction (i.e. related to the particular properties of Facebook, such as social contact with offline friends), or it is simply another form of gaming addiction. This will be discussed again in Chapter 10.

9.2.3. Excessive use. A substantial number of survey respondents admitted that they used Facebook excessively. This result was expected, given that the recruitment advertisements asked for participants who felt that they spent too much time on Facebook (see Section 8.1.3). Furthermore, in a previous qualitative study of Facebook Addiction, participants who were considered to be excessive users were personally aware of their high frequency use (Zaremohzzabieh et al., 2014).

In general, responses coded as excessive use simply acknowledged that the
individual was aware that they used Facebook too much. For example, the following focus group participants wrote:

“…I spend far too much time on facebook” (Female, 32, Very Heavy, Focus Group)

“…my biggest concern would be the amount of time I spent on FB” (Female, 29, Heavy, Focus Group)

In addition, a small number of survey respondents mentioned that the recognition of this fact caused them to take a break from Facebook use:

“[I stopped using Facebook because] I realised I was using it too much and it was taking over my life in too many ways.” (Male, 29, Light)

“[I stopped using Facebook because] I knew I had a problem with the amount of time I spent on Facebook, I actually got frustrated with people for not updating their statuses regularly giving me something to read and it got boring so I knew that it was time to give myself a break.” (Female, 27, Moderate)

A few participants referred to excessive Facebook use as a catalyst for negative consequences, such as relationship problems:

“My partner hates that I am on [Facebook] all the time…” (Female, 30, Very Heavy)

“Being on [Facebook] at night instead of spending time with my husband meant that we felt ‘less close’ and were less intimate than before.” (Female, 26, Moderate)

A sizable number of participants mentioned that they had been told by someone that they spend too much time on Facebook:

“My husband thinks I spend too much time on Facebook, and that I would get more done around the house if I wasn’t always on the computer.” (Female, 33, Heavy)

“My Dad tells me I use [Facebook] too much because I’m always checking it.” (Female, 25, Very Heavy)

Similarly, a large number noted that their excessive use was a particular concern to them:

“[My Facebook use] was eating into my day and I actually couldn’t control how often I checked it.” (Female, 28, Moderate)

“I use [Facebook] too much and it’s addictive, I get concerned when I consider
In Phase 2, the thematic analysis of the open-ended survey question ‘What concerns you about your Facebook use?’ (see Section 7.3.2) also highlighted the high number of participants who felt that they were using Facebook too much. Therefore, there is evidence that excessive Facebook use does occur. In many cases, it seems that the excessive use is noted by the user themselves, or individuals who are close to that person (i.e. parents, romantic partners). This recognition can cause some users to take a break from Facebook, but most respondents in the sample appeared to continue their use.

9.2.4. Withdrawal. When analysing open-ended data for evidence of withdrawal, responses were included if participants referred to experiencing (or hypothetically experiencing) unpleasant feelings (i.e., anxiety, frustration, feeling lost) when not being able to access Facebook, or if they had difficulties (or anticipated having difficulties) staying away from Facebook. Both of these themes were represented in the data, as discussed below.

9.2.4.1. Unpleasant feelings. There were several references to unpleasant moods states in the survey data. To illustrate the kinds of unpleasant moods that were referred to, some examples are useful. Participants who had experienced time without Facebook admitted feeling depressed, moody, anxious, and irritable. For example:

"[I stopped using Facebook and] during downtime from doing activities I felt depressed, times when I would normally check Facebook were awkward for me and felt as if I was suffering from the withdrawal." (Male, 18, Heavy)

"[Without Facebook I felt] very moody and stressed." (Female, 25, Very Heavy)

Some participants also mentioned that they felt (or would feel) lost when they were without Facebook:

“I was bored, lost [without Facebook]. Didn’t know what to do with my time.” (Female, 30, Heavy)

"[Without Facebook I felt ] lost, it’s like my lifeline to normal life talking to adults instead of just kids.” (Female, 23, Heavy)

One of the focus group participants also referred to feeling withdrawal from Facebook:

“To answer the question of withdrawal symptoms, yes, I think I do experience..."
them. If I go for too long without checking Facebook I feel ill-at-ease and have strong urge telling me to log in.” (Male, 19, Canada, Focus Group)

The above responses show that mood-related withdrawal symptoms can occur in response to the absence of Facebook use. A similar finding was presented in Chapter 7, as two of the Phase 2 focus group participants mentioned feeling anxious when they could not access Facebook. In addition, several survey respondents in Phase 3 who had never been without Facebook access were able to imagine that this situation would cause them distress:

"I would probably suffer anxiety [without Facebook] as it has become a habit to check it every few minutes - once an hour is generally the longest I go during the day - and only when in a meeting or class is it this long." (Female, 37, Heavy)

"I think I might feel anxious and/or a little bit distressed [without Facebook].” (Female, 39, Very Heavy)

For all of these users, Facebook use seems to be so ingrained in their daily lives that taking it away did (or would) have an undesirable impact. Similar results were also found in a study of Malaysian university students (Balakrishnan & Shamim, 2013).

9.2.4.2. Trouble staying away. Some participants mentioned that they had (or would have) trouble staying away from Facebook. As per the definition provided in Section 7.3.3.5, these responses were also categorised as withdrawal. Some examples are provided below:

“I would ensure that [not having access to Facebook] would not happen. If I don’t have my laptop, I have my phone otherwise I can log on at work.” (Female, 36, Heavy)

“I feel very connected and "in the loop" by using FB, so wouldn’t want to be without it. If I didn’t have internet access at home, I’d find an internet cafe or wifi." (Female, 39, Very Heavy)

These quotes suggest that being without Facebook access would be so disturbing that participants would actively seek out an Internet connection so that they could connect again. Such comments reveal how important and habitual Facebook use can become. It is worth noting that all responses in this theme were made by women in their mid to late thirties, and all were heavy or very heavy Facebook users.

In conjunction with the evidence collected in Phase 2, the additional data presented here suggests that the development of Facebook withdrawal is possible. These feelings of withdrawal were expressed as cognitive symptoms, rather then
physiological. This is not surprising, given that Facebook Addiction is a form of behavioural addiction, rather than a substance-related addiction.

9.2.5. Mood alteration. Mood alteration involves using a particular stimulus to escape from dysphoria. Some participants did mention using Facebook when they were experiencing dysphoric mood states, such as loneliness and unhappiness. Similar findings also emerged from the Phase 2 focus group (see Section 7.3.3.4). These themes will now be explored further.

9.2.5.1. Loneliness. There were a small number of responses relating to loneliness, and these arose out of all three of the mood-related questions (checking Facebook, making status updates, and using Facebook). In some cases, these references were brief and provided little insight into this experience:

“[I decide to use Facebook when I feel] lonely, isolated.” (Female, 31, Heavy)

“[When I decide to use Facebook] I’m usually feeling bored or lonely.” (Female, 39, Very Heavy)

However, some participants indicated that using Facebook when lonely could be useful for re-establishing a sense of connection:

“[I decide to use Facebook when I’m feeling] loneliness from the outside world. When I want to socialise I open Facebook.” (Male, 18, Heavy)

“[I decide to use Facebook when I’m] feeling loneliness or feeling disconnected and wanting to reconnect with people.” (Female, 19, Moderate)

Some of these comments referred to the fact that it was a sense of physical isolation that spurred on Facebook use:

“Lonely is too strong a word, but sometimes if I’ve been working at home by myself or otherwise spent some time alone, I’ll check fb as a way of feeling connected with some friends…” (Male, 51, Light)

“[I decide to use Facebook when I’m] wanting to catch up on family and friends news, as I live on my own, far from close family and friends.” (Female, 62, Moderate)

This participant further noted that Facebook browsing helped her to feel, “sensations of enjoyment and connection, being able to have news of family and friends”. Therefore, it seems that simply browsing the status updates of Facebook friends

\[40\] A large number of survey respondents mentioned using Facebook when bored, but as boredom is not a recognized form of dysphoria, these comments were not included as a mood alteration theme. Instead, they were considered as a potentially unique theme (discussed in Section 9.3).
could be an effective method of alleviating loneliness.

Aside from browsing Facebook, several participants mentioned that they posted status updates when they felt lonely or were seeking attention:

“When I used to update, I found I would update most when lonely. I used to travel for work constantly (FIFO worker) and found updating my profile to be a bit of a cry for attention.” (Male, 29, Light)

“Honestly, if I ever update my status it’s because I want some form of attention. I think most people are the same, whether or not they would choose to admit it.” (Female, 20, Heavy)

Based on the quotes above, it seems likely that when Facebook users update their status in a lonely or attention-seeking frame of mind, they have the outcome expectancy that mood alteration will occur when social contact is received. If this is the case, it is possible that reinforcement of the Facebook checking or updating behaviour could occur.

While online addictions researchers have not explicitly referred to the theory of outcome expectancies when discussing mood alteration, scholars from the field of substance-related addictions have identified that mood change may be an outcome expectancy linked to alcohol (Jones et al., 2001) and nicotine addiction (Colvin & Mermelstein, 2010). Given this association, it is likely that outcome expectancy explains how using Facebook to escape from loneliness could lead to Facebook Addiction. This may explain why Lee et al. (2012) found a relationship between using Facebook for mood regulation and deficient self-regulation of use. However, more research is needed in this area, since neither the survey nor focus group questions specifically asked whether using Facebook led to mood alteration.

9.2.5.2. Unhappiness. Outcome expectancies may also explain why people use Facebook when they are unhappy. The following quotes allude to the fact that checking or using Facebook can be a useful method of distraction or escape from an unhappy mood:

“[I check Facebook when I am] unhappy and looking for a distraction.” (Female, 27, Heavy)

“When I am sad or disturbed by some family matters I decide to check Facebook. I generally don’t check Facebook when I am happy. For me Facebook is a good thing by which I can divert my attention from the real world.” (Male, 19, Moderate)

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41 FIFO stands for ‘fly in, fly out’. FIFO workers generally spend large periods of time away from home.
Research has shown that distracting oneself from rumination is a useful strategy for reducing the effects of dysphoria (Douglas, 2000; Williams & Moulds, 2010). Seeking distraction through Facebook could occur through socially passive activities, such as checking Facebook for new content (as mentioned in Section 9.2.2.1). While this behaviour may lead to positive effects initially, over time it is possible that more and more Facebook checking (i.e. tolerance) may be necessary to achieve the mood alleviation. While the present study did not assess the latter behaviour (as tolerance was not one of the seven core symptoms identified in the systematic review; see Chapter 6), further research of this concept is warranted.

Aside from distraction, individuals who use Facebook when unhappy might also be trying to seek relief by gaining a sense of social support. Social support is defined as “information leading one to believe that he/she is cared for, loved, esteemed, and a member of a network of mutual obligations” (Cobb, 1976, p. 300). It has been well established that the presence of social support can buffer against depression (George, Blazer, Hughes, & Fowler, 1989;) and the negative effects of stressful life events (Cohen & Wills, 1985). In support of this expectation, some individuals did admit that they would update their Facebook statuses when feeling sad:

“I normally update my status when I have some feelings like sadness...”
(Female, 19, Very Heavy)

Similarly, survey respondents also referred to updating Facebook statuses in order to vent:

“On occasion (I would say 4/10 times) i will update my status about something that has really frustrated me and caused me to want to vent which is why i am writing in on facebook.” (Female, 24, Very Heavy)

“Cranky mood = vent status” (Female, 32, Moderate)

This sort of behaviour was also seen in the Phase 2 focus group (see Section 7.3.3.4), as Participant 3 admitted posting status updates when she was feeling upset, and waiting for responses. However, she noted that if she did not receive any responses to her post, this could make her feel worse. A comparable comment was made in Phase 3:

“[I use Facebook when I feel] very sad/anxious and in need of support. Though I have been trying to restrain myself from posting when feeling bad as
it can often make me feel worse when support is not offered, and worried that I may be affecting other people with my sad post." (Female, 33, Moderate)

While there is nothing inherently wrong with seeking social support on Facebook, as already discussed, this behaviour could become reinforced through the improvement in mood that occurs though Facebook posting and subsequent receipt of feedback. In fact, researchers have previously indicated that social support is a relevant factor to Internet Addiction (Kaliszewska-Czeremska, 2011). As people who have a strong sense of offline social support would presumably not need to rely on Facebook to increase their moods, this behaviour may be more common among people who have a strong preference for online interaction, or those who are physically isolated from others.

9.2.6. Online social enhancement. Responses indicative of online social enhancement were coded into three themes: Facebook socialisation is easier than offline socialisation, Facebook socialisation offers more social control than offline socialisation, and reliance on Facebook socialisation. These themes are explored below.

9.2.6.1. Facebook socialisation is easier. This theme was the strongest of the three. While many of the responses were brief, and did not elaborate on why Facebook socialisation was easier, a subset indicated that Facebook communication lessens inhibitions and enhances social confidence. Given this situation, it is possible that many of the individuals who felt that Facebook communication was easier were shy or socially anxious in real life. The following quotes support this argument:

"[It is] sometimes easier talking online due to social anxiety." (Female, 23, Moderate)

"I am quite a shy person in real life, but not on Facebook." (Female, 29, Heavy)

In contrast to these quotes, most participants who made responses coded into this theme did not explicitly mention that they were shy or socially anxious in real life. However, some responses did provide other indicators that this might be the case.

Baker and Oswald (2010) point out that, in real life, shy people avoid communicating with others because they feel that they lack social skills. Due to this, they are more sensitive to the non-verbal cues that their conversational partners provide. Often, they interpret these cues in a negative manner, and assume that they are being harshly evaluated. In contrast, online communication protects these
individuals from receiving non-verbal cues, which has the resulting affect of alleviating these concerns. This trend was seen in the following quotes:

"[It is] easier to make conversation [on Facebook, it is] less awkward than eye to eye contact." (Male, 20, Heavy)

"[Socialising on Facebook is different because] you are hidden behind a computer screen. You have less inhibitions and are braver, more likely to say things that you wouldn't in real life." (Female, 34, Heavy)

Therefore, it seems that for some people, the lack of social cues afforded by Facebook communication increases social confidence and decreases inhibitions. This trend seems to be more prevalent among heavy and very heavy Facebook users. As previously noted (see Table 4.4), Lee et al. (2012) found that having a preference for online social interaction was tied to Facebook Addiction. Therefore, it is likely that these some of these quotes were made by Facebook addicts (this concept will be explored further in Chapter 10).

9.2.6.2. Facebook socialisation offers more social control. In regards to increased feelings of social control, many of the responses can be explained by shyness or social anxiety. For example, research has shown that shy people tend to prefer online interactions, as the slow and asynchronous nature of text-based communication allows them to take their time to think about responses (i.e., Baker & Oswald, 2010; Caplan, 2002). This trend was also seen in the focus group data from Phase 2, particularly for Participant 1 (see Section 7.3.3.2). She noted that using Facebook allowed her to feel connected to others without feeling a need to engage in conversation. When conversation did occur, she was afforded plenty of time to think about her responses, and this alleviated the discomfort that she felt in face-to-face communicative situations. There were also a small number of similar responses in the survey data, as the following examples illustrate:

"Socialising on fb feels sort of "safe" in a way because I can have a form of conversation but I can consider what I say." (Male, 51, Light)

"I find it easier [to socialise on Facebook] as I can revise what I say before I post it whereas in real life I would just speak and then feel stupid after or spend ages analysing what I just said and regretting it. I also tend to be more chatty on fb and interested in socialising with other people than I would be in real life." (Female, 25, Moderate)

By taking their time to think about responses, socially anxious and shy individuals are afforded more social control than in real life interactions. They are also provided with
the ability to self-edit, which offers another level of control for the socially anxious:

"I act different on Facebook than I would in person because I am protected by the screen. I can speak my mind then quickly change what I said by deleting that post; I don't have that option in person. Facebook makes me appear more confident than I really am." (Female, 23, Light)

"Facebook provides a barrier where as face to face things can not be deleted." (Male, 30, Moderate)

According to Caplan’s (2010) social skill model of Generalised Problematic Internet Use, shy and socially anxious individuals are at greater risk of developing online addiction through their preference for online social interaction. Therefore, if socially anxious or shy people feel better able to communicate using Facebook, and they are sufficiently motivated to use Facebook in this way (i.e. if they are lonely), there is a risk that they could develop Facebook Addiction. This is an area that will be addressed again in Chapter 10.

9.2.6.3. Reliance on Facebook socialisation. Throughout the survey responses, there were few quotes that tapped into the theme of reliance on Facebook for social interaction. This is likely because the open-ended question relating to social behaviour on Facebook was worded broadly. However, the following responses seem to point towards the utility of Facebook for keeping in touch with groups of people who participants would otherwise lose contact with:

"[Facebook] allows me to keep in touch with friends who I see rarely in real life for various reasons (family, business etc.)." (Male, 39, Moderate)

"[Facebook] gives me access to friends that I would normally lose touch with because they are either in another state or overseas. I get to see where they are in their lives through their posts and photos." (Female, 40, Light)

As the above references are general, they do not clearly point to online social enhancement or Facebook Addiction. However, one survey respondent admitted that he had used Facebook problematically in the past, and this was due to a reliance on Facebook for social interaction:

"When doing FIFO work, Facebook was the only way I felt I could stay connected to my friends. Facebook for me now is not a form of socialising and it plays a very minute piece in my life. I now actively seek out to meet with people or talk to them directly." (Male, 29, Light)

Similarly, focus group respondents mentioned the fact that they used Facebook excessively because it enabled social interaction that they were lacking in their offline
It used to be the best way I could talk to certain good friends (I live in England whilst they live in Scotland/Canada). That was my excuse for the amount of time I spent on it…” (Male, 19, Very Heavy, Focus Group)

“I am a single parent, so once the child goes to bed, Facebook is my opportunity to be ‘social’ as I’m often limited in real life to be.” (Female, 29, Heavy, Focus Group)

In Section 8.3.1.4, it was pointed out that the majority of heavy and very heavy Facebook users did not have serious levels of concern about their Facebook use. One of the potential explanations given for this trend was that some individuals justify their excessive Facebook use due to the perceived benefits that it brings. As can be seen in the focus group responses above, this trend seems to have been supported in Phase 3 as well. In addition, two survey respondents alluded to the social benefits of Facebook:

“I am concerned that I enjoy [Facebook] too much and am involved in it at the expense of other facets of my life. I’m not overly worried, however, as I feel that it fulfills a real need in my life to connect with others with similar values in a way that I find difficult as a [stay at home mother] and it really helps to facilitate my real life social contact.” (Female, 28, Moderate)

“Nobody knows what I look like on Facebook (I don’t have photos online) and I am accepted and befriended by many people of all ages from all around the world due to our similar interest in games etc online. I probably spend too much time socialising online when I could be outdoors and/or doing something more constructive physically – but mentally Facebook has been great for me ☺” (Female, 48, Very Heavy)

In Section 7.3.3.2, similar responses were made by two of the Phase 2 focus group respondents. With the inclusion of the data from Phase 3, this theme has now received further support. Therefore, while it is likely that feeling reliant on Facebook use for social interaction is associated with Facebook Addiction, in some cases it might bring benefits that outweigh the negative consequences. As a result, the experience of negative consequences may be considered a necessary component for a diagnosis of Facebook Addiction.

9.2.7. Loss of control. As already demonstrated, comments relating to loss of control over Facebook use were made by some respondents, even though there was no direct question about this experience in the survey. References were coded into three themes: spending longer than intended, trouble limiting use, and addiction.
These themes are expanded upon below.

9.2.7.1. Spending longer than intended. As mentioned in Section 9.2.1, there were several references to the fact that participants spent longer on Facebook than they expected, particularly when taking a break from studying. Three focus group participants also mentioned spending longer on Facebook than intended. These responses do seem to fall under the definition of loss of control (see Section 7.3.3.6), as shown in the quotes below:

“Often I log in saying to myself that it’s just a 5 minute check, but I mess around for an hour or longer. Chatting, playing games, it’s so easy to waste time.” (Female, 33, Heavy, Focus Group)

“I could spend hours [on Facebook] without even realising it.” (Female, 29, Very Heavy, Focus Group)

In Phase 2, only one participant made reference to the experience of spending longer than intended on Facebook (see Section 7.3.3.6). The emergence of this theme in Phase 3 strengthens the argument that loss of control over Facebook use does occur.

9.2.7.2. Trouble limiting use. This theme reflects the recognition that individuals have trouble limiting their Facebook use, even though they acknowledge that they are spending too much time, or using it in inappropriate ways (such as in social situations or at work). Several quotes that fit within this theme have already been provided, particularly within the section relating to negative consequences (Section 9.2.1). Two further examples are provided below:

“I wish I could restrict my access to a reasonable amount of time (15 minutes morning & evening)” (Female, 38, Very Heavy)

“I carry my smartphone with me throughout the day and check it every 10-15 minutes, even during meetings. If I see the Facebook update icon, I become distracted and feel an almost compulsive need to check what the update is.” (Male, 47, Moderate)

To further explore this concept, focus group participants were asked specifically about whether they had trouble limiting their Facebook use, and three responses were coded into this theme:

“I do [have trouble limiting my use]. It used to be the best way I could talk to certain good friends. That was my excuse for the amount of time I spent on it but even now we talk much less I find myself going on it all the time (its even open now).” (Male, 19, Very Heavy, Focus Group)
“I have trouble limiting my Facebook use as I see Facebook as my contact with the rest of the world. I tell myself that it is good that I have made so many friends with similar interests (through the games I play and groups I’ve joined) but really I know that it would be even better for me to physically seek out friends/groups locally.” (Female, 48, Very Heavy, Focus Group)

“I struggle with its addictive nature. I wake up – “must see what happened over night” – log into FB. Boredom strikes at work – log into FB. Stressful day at work, come home – log in and vent on FB. I honestly don’t know why I can’t limit it, all I know is that I’ve tried and it just draws be back in again. I feel for me, it may be a case of all, or nothing. I don’t do moderation very well.” (Female, 29, Heavy, Focus Group)

The above responses indicate that while some people do recognise that their Facebook use is excessive, they are reluctant or unable to limit their use. In addition, it seems that the reasons for this can vary. Two participants quoted above mention that it is the social element that keeps them returning to Facebook. Both responses seem to imply that they are reliant on Facebook for communication, which supports Davis’ (2001) cognitive behavioural model of Internet Addiction. However, the response from the 29-year-old female indicates that her reliance on Facebook is multifaceted. She not only feels a pull to check Facebook for updates, but also uses it to vent after a bad day at work and when she is bored. When taken in conjunction with the other findings discussed in this chapter, it appears as if performing these sorts of activities might be related to a desire for mood alteration, due to loneliness, sadness, anger, need for attention, or boredom. Therefore, this potentiality will be further explored in Chapter 11.

9.2.7.3. Addiction. In Phase 2, one of the focus group participants mentioned feeling addicted to Facebook. This was interpreted as evidence of loss of control over Facebook use (see Section 7.3.3.6). In Phase 3, several participants also mentioned feeling addicted to Facebook. Quotes from survey respondents are provided below:

“I think it is an addiction. Sometimes I am checking Facebook when I should be giving my kids attention. I have also checked Facebook when driving which is very concerning.” (Female, 33, Moderate)

“[I am concerned] that [Facebook] will break my husband and I up it’s pretty addictive” (Female, 33, Very Heavy)

The participants quoted above both mentioned that their addictive Facebook use was concerning to them, which shows a level of self-awareness about their problem. Several focus group participants also acknowledged that Facebook could be addictive, as the quotes below demonstrate:
“Honestly, I really believe FB is addictive. I've never felt anything like it! I don't drink, or smoke, but I get the feeling that my use of FB would be similar to those faced with changing those addictions.” (Female, 29, Heavy, Focus Group)

“I think social interaction can be addictive and for many Facebook is a way they can interact 24/7. I found that I was often up until around 7am talking then having to go to work/college with no sleep at all. Now that I can't interact 24/7 on facebook I still find myself on it almost as long but doing nothing.” (Male, 19, Very Heavy, Focus Group)

Together with all of the qualitative data already discussed, the quotes provided above seem to validate the existence of Facebook Addiction. They also show how this disorder can lead to negative consequences (i.e., trouble in relationships, lack of sleep) for some people, as well as causing them personal concern.

9.3. Thematic Analysis of Potentially Unique Indicators of Facebook Addiction

In order to answer RQ3, qualitative survey responses were thematically analysed to ascertain whether there was any evidence of unique indicators or symptoms of Facebook Addiction. This analysis was particularly focused on the additional themes from Phase 2, as highlighted in Section 7.3.3.7. Therefore, the subsections below discuss evidence relating to social obligation, mood maintenance, and disconnection. In addition, it was expected that additional themes could emerge in this larger dataset. This expectation was met, and two new themes – boredom and fear of missing out – are introduced in Sections 9.3.2 and 9.3.3. Table 9.2 illustrates the strength of each of these five potential symptoms or indicators of Facebook Addiction.

Table 9.2

<table>
<thead>
<tr>
<th>Potential Symptoms or Indicators</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mood maintenance</td>
<td>111</td>
<td>27</td>
</tr>
<tr>
<td>Boredom</td>
<td>86</td>
<td>21</td>
</tr>
<tr>
<td>Fear of missing out</td>
<td>59</td>
<td>14</td>
</tr>
<tr>
<td>Disconnection</td>
<td>45</td>
<td>11</td>
</tr>
<tr>
<td>Social obligation</td>
<td>13</td>
<td>3</td>
</tr>
</tbody>
</table>

Frequencies and Percentages of Respondents Providing Responses Indicative of Potentially Unique Symptoms or Indicators of Facebook Addiction
As the table illustrates, mood maintenance was the strongest of the four themes; however, the relevance of this theme to Facebook Addiction is addressed below. Evidence supporting each of the remaining themes is also presented.

9.3.1. Mood maintenance. In Chapter 7, two focus group respondents admitted using Facebook when they were having positive experiences. According to those individuals, this use was motivated by the desire to share their excitement with their friends. These responses were interpreted as being indicative of mood maintenance, and it was suggested that the desire to engage in this form of behaviour could be associated with Facebook Addiction. However, it was stated that further evidence was needed to confirm this.

In Phase 3, many participants also provided indications that they used Facebook to share information when experiencing positive moods. Some examples are provided below:

“[I update Facebook] when I am excited about something I want to tell my friends straight away.” (Female, 31, Light)

“[When I update Facebook] usually I am in a happy mood and wish to share this excitement or event that may have happened with family and friends.” (Female, 39, Moderate)

In general, however, the majority of participants who referred to updating Facebook when in positive moods also mentioned that they did the same thing when they experienced strong negative moods:

“Usually when I feel a relatively intense emotion (joy, anger, exasperated etc) I will update my status about the trigger.” (Male, 22, Heavy)

“[When I update Facebook] I am either usually very happy about something or very annoyed by something. I don’t update my status with mundane “I went to the toilet today’ things.” (Female, 30, Moderate)

As the last quote demonstrates, updating Facebook when intense emotions occur is likely driven by the need to share important, interesting, or funny content. In fact, a large number of references were made in support of this:

“I update my status when I have something to share. Generally it’s when I’m happy, see something interesting, or want to vent. I don’t update my status to share mundane things that are happening as some people do: e.g., eating breakfast, feeling bored.” (Male, 27, Moderate)
“If I update my status, it’s usually because something of note has happened to me, I am particularly happy/excited/sad/emotional about something.” (Female, 33, Heavy)

Overall, the tendency to update Facebook statuses during strong moods, and/or when something particularly noteworthy has occurred, does not logically point to mood maintenance. Instead, this behaviour might simply be motivated by the desire to share information that will be considered interesting to the intended audience (i.e. friends and family).

On the other hand, it may be the case that addicted individuals update Facebook when experiencing strong moods because they recognise that posting emotionally charged content increases their likelihood of receiving feedback from others. By maximising their chances of receiving social contact, they are more likely to successfully ameliorate unwanted moods states such as loneliness (as posited in Section 9.2.5.1). If the latter argument were correct, this behaviour would be classified as mood alteration, rather than mood maintenance. Clearly, the data provided here is insufficient to prove this assumption. Future research could examine this more directly.

9.3.2. Boredom. In the Phase 2 focus group, Participant 3 mentioned lurking around Facebook when she was bored. This was also a strong theme in Phase 3, as several of the responses provided in Section 9.2 revealed. Some further examples are provided below:

“Sometimes I am bored so I go to facebook to see what is happening.”
(Female, 39, Very Heavy)

“I often [check Facebook when I am] bored and looking for something to do.”
(Female, 33, Heavy)

Previously, researchers have noted that individuals who have excessive free time may be prone to online addictions. For example, in a qualitative study of online gamers, one young man attributed his excessive gaming to having large amounts of free time, while another noted that gaming was a good way to waste time (Hussain & Griffiths, 2009). Another study found that being unemployed, being a student, and being retired were all significant predictors of gaming addiction (Hussain et al. 2012). In relation to social networking site use, Zhou and Leung (2012) reported that leisure boredom was a significant predictor of gaming addiction through social networking sites. Therefore, it may be the case that Facebook Addiction is linked to boredom.
However, given that previous research has identified a link between boredom and other online addictions, it is unlikely that this is a unique symptom of Facebook Addiction.

9.3.3. Fear of missing out. This theme relates to the fact that some respondents felt they might be missing out on something when they weren’t logged on to Facebook. Comments of this nature were made in response to the question asking about thoughts when not using Facebook (preoccupation):

“I wonder what is happening! Am I missing something!” (Female, 34, Light)

“What have I missed out on reading?” (Male, 18, Moderate)

Although these comments are broadly worded, they could be interpreted as pointing towards a need to check the News Feed. Supporting this assumption, one respondent specifically mentioned the News Feed in their quote:

“I wonder if I’m missing out on anything that’s happening in my newsfeed because I’m not monitoring it.” (Female, 39, Heavy)

The majority of comments within this theme stemmed from the questions relating to ceasing Facebook use for a long period of time (withdrawal):

“If I stopped using Facebook] I’d feel like there was some major events occurring or had happened to someone which I don’t feel I am in the know about. Definitely would make you want to know how the health and status of others are doing.” (Male, 25, Moderate)

“If I stopped using Facebook] I would be slightly anxious about how much I would have missed that I should know about (people getting engaged, passing away, important life events I’m expected to know, etc.).” (Male, 30, Moderate)

All of the above responses are indicative of a fear of missing out when Facebook is not being used. This phenomenon is beginning to come to the attention of social scientists (i.e. Turkle, 2011), and has been defined as “a pervasive apprehension that others might be having rewarding experiences from which one is absent” (Przybylski et al., 2013, p. 1841). In an attempt to thwart this feeling, Facebook users may aim to stay connected as much as possible. In fact, Przybylski et al. found that fear of missing out was associated with high levels of social media engagement. In regards to Facebook use in particular, people who had high levels of fear of missing out were more likely to more frequently use Facebook after waking, prior to going to sleep, and during mealtimes. Therefore, it is likely that fear of
missing out might be involved with Facebook Addiction. The following quote supports this argument:

“*I feel I use [Facebook] excessively but without it I feel I’m missing out on valuable information.*” (Female, 26, Light)

This potential symptom might be related to a different form of Facebook Addiction than that triggered by the desire for social contact or support. For example, it could be tied to the belief that Facebook is the main source of news about friends and family. Individuals who become addicted to Facebook in this way may believe that *social monitoring* is highly important. The following quote is supportive of this assumption:

“*I felt like I missed out on stuff [when I wasn’t using Facebook] because people only put things on FB, they don’t share with you personally.*” (Female, 28, Light)

At this point, none of the studies of Facebook Addiction presented in Table 4.4 explicitly mentioned fear of missing out. Further research is therefore needed to confirm this potential alternative pathway to addiction.

### 9.3.4. Disconnection

The theme of disconnection first emerged in Phase 2, where two participants noted that cessation of Facebook use would leave them feeling cut off from their personal networks. This was also a strong theme within the Phase 3 data, particularly in the responses to the questions relating to withdrawal. Participants who had spent time without accessing Facebook provided the following responses:

“*[Without Facebook] I felt disconnected from a lot of my family and friends. I was sad because I was left out of being invited to social events and family gatherings.*” (Female, 23, Light)

“*[Without Facebook I felt] disconnected socially from what was going on in the rest of my friends life.*” (Male, 32, Moderate)

Similarly, several participants who had never been in a situation where they were unable to access Facebook also suspected that they would feel disconnected if this were to occur:

“*[Without Facebook I would feel] disconnected from some friendships which are important to me.*” (Female, 48, Very Heavy)

“*[Without Facebook I would feel] disconnected from friends who are scattered
As mentioned in Chapter 7, one previous study identified that cessation of Facebook use is associated with disconnection. Sheldon et al. (2011) reported that, during a 48-hour forced absence from Facebook use, participants’ level of connectedness reduced. Furthermore, when Facebook use was resumed, disconnected participants engaged in greater Facebook use. In a follow up study, the researchers found that disconnected individuals were less likely than connected individuals to set ambitious goals for Facebook reduction. Moreover, during periods of absence from Facebook, these participants were more likely to fail to meet their reduction targets. Taken in conjunction with the results of this study, the argument that disconnection may be linked to Facebook Addiction seems to be viable.

It seems that Facebook use is now so prevalent that it has become deeply integrated into real life social networks. As a result, some people feel as if interacting on Facebook is vital to their continued feelings of social connection. For example, several participants stated that they even though they disliked Facebook, they had to keep using it in order to continue social interaction:

“I actually despise Facebook, but as I am living in a foreign country I feel like I need it to keep in contact with friends from home.” (Male, 21, Heavy)

“I am actually over it – however I feel that if I stop the usage I will be cut off from everything. Nobody emails/texts/calls anymore – it’s all via Facebook.” (Female, 32, Moderate)

Given that several individuals who dislike Facebook report feeling this way, it is highly probable that Facebook addicts also feel pressure to continue using the site for social reasons. If so, finding the motivation to permanently cease Facebook use would be an extremely difficult task, and one that they might perceive as leading to feelings of disconnection. Support for this line of thinking can be seen in the following quote:

“I am concerned that I wouldn’t be able to stop using facebook because I would feel disconnected from those I consider friends.” (Female 24, Very Heavy)

In serious cases, cessation of Facebook use might even be perceived as causing loss of important relationships. Such beliefs would likely hinder the attempts of Facebook addicts to limit or stop using the site, and increase the chances of relapse. Therefore, it is likely that avoidance of feelings of disconnection could encourage
9.3.5. Social obligation. In Phase 2, two focus group respondents alluded to the fact that they felt socially obligated to keep using Facebook (see Section 7.3.3.7). This sentiment was also echoed in the Phase 3 survey responses, as shown below:

“If I haven’t checked my [Facebook] account for more than two days I am afraid [of] people being angry at me not answering.” (Female, 21, Heavy)

“Sometimes feel there is pressure to reply to someone’s [Facebook] post because I don’t want to hurt their feelings by not acknowledging them.” (Female, 33, Moderate)

While there is no clear indication that these responses were made by Facebook addicts, it is easy to imagine that feelings of social obligation would also occur amongst addicted individuals, particularly those who were trying to cut down on their use. In fact, in the Phase 3 focus group, one participant mentioned that she had attempted to stop using Facebook because of addictive tendencies, but she was:

“…interrogated by one particular friend about it, and basically told, ‘It’s the way of the world so suck it up’”. (Female, 29, Moderate, Focus Group)

As shown above, feelings of social obligation can motivate individuals to continue using Facebook. As Facebook continues to become increasingly integrated into the social lives of its users, it is possible that these feelings could intensify. Therefore, this could be a potential relapse trigger for Facebook addicted individuals. However, in this research phase, only limited support was found for this argument. As such, this is an area that deserves further attention.

9.4. Summary

This chapter presented the thematic analysis of qualitative data from the Phase 3 online survey and online focus group. Although many of the open-ended questions were worded broadly, the analysis provided support for each of the seven potential symptoms of Facebook Addiction. As such, it is argued that all of the core symptoms of Internet Addiction can be found within potentially problematic users of Facebook. Furthermore, it appears that there are several additional potential indicators of Facebook Addiction. It was concluded that boredom, disconnection, and fear of missing out may be related to Facebook Addiction, but more information is needed to confirm the experiences of mood maintenance and social obligation. In
general, the discussion within this chapter builds upon the qualitative findings from Phase 2, and begins to illuminate several potential pathways to Facebook Addiction (this will be discussed further in Chapter 11). Having answered RQ3 and 4, the focus of this thesis now turns to answering RQs 4 and 5.
Chapter 10
Phase 3: Identifying and Exploring Potential Facebook Addicts

The thematic analysis of qualitative data presented in Chapter 9 answered two research questions. First, supporting evidence for the seven potential core symptoms of Facebook Addiction was found, thus answering RQ2. In addition, RQ3 was answered through the identification of several unique themes that are potentially related to Facebook Addiction. However, to answer the remaining research questions, it was necessary to identify a group of potential Facebook addicts. In doing so, it was then possible to ascertain whether Facebook Addiction takes different forms (RQ4), and determine whether certain demographic, behavioural, or attitudinal variables predict Facebook Addiction (RQ5).

In order to answer the remaining research questions, it was first necessary to transform qualitative survey data that were indicative of the potential core symptoms of Facebook Addiction into quantitative variables. In this way, a preliminary measure of potential Facebook Addiction was created. This chapter describes the process involved in creating this measure. It then moves on to answering RQs 4 and 4 using inferential statistics.

10.1. Development of a Preliminary Measure of Facebook Addiction

The process of creating a preliminary measure of potential Facebook Addiction involved the following steps: examining responses to the open-ended survey questions for evidence of the core symptoms of Facebook Addiction, providing a score for each symptom that was present, calculating a total addiction score, and proposing a cut-off point for Facebook Addiction. The following subsections describe these steps in more detail.

10.1.1. Data transformation. Two postgraduate psychology students (one female and one male) were employed as raters, and asked to independently assess responses to 11 of the 13 open-ended survey questions relating to Facebook Addiction\(^{42}\). Raters were provided with the coding criteria for each of the relevant questions, examples of quotes that should be positively coded, and exclusion criteria.

\(^{42}\) The two excluded questions provided contextual information about time spent without Facebook use and, thus, were not relevant symptoms of addiction.
Coding criteria were provided for six of the seven potential symptoms of Facebook Addiction. The excluded symptom - loss of control – was replaced by another potential indicator of Facebook Addiction: self-identified recognition of potential Facebook Addiction.

While it would have been preferable to include an indicator of loss of control in the preliminary measure of Facebook Addiction, the question that was designed to tap in to this symptom (“What concerns you about your Facebook use?”) was worded too broadly to elicit a large number of responses meeting the criteria for this symptom. However, some of the responses that were received to this question revealed a level of self-acknowledgement that problematic behavioural patterns (or symptoms of addictive behaviour) were occurring in relation to Facebook use. Therefore, these potentially useful responses were included.

10.1.2. Selection of symptoms. In creating the preliminary measure of potential Facebook Addiction, a decision was made to only include indicators of potential symptoms that demonstrated an acceptable level of agreement between raters. Calculation of a series of Cohen’s kappa coefficients revealed that there was an almost perfect level\(^\text{43}\) of agreement for the potential indicators of negative consequences with daily activities (.99), preoccupation (.97), mood alteration (.92), excessive use (.89), and self-identified recognition of potential Facebook Addiction (.87). There was also a substantial level of agreement between coders for the potential indicators of withdrawal (.78) and negative consequences to personal relationships (.66). In contrast, the kappa coefficient for online social enhancement was only moderate (.56)\(^\text{44}\).

All indicators that received a kappa coefficient of at least .61 (thus indicating a substantial level of agreement according to Landis & Koch’s [1977] guidelines) were included. Applying this cut-off meant that only one potential indicator of a symptom was excluded: online social enhancement. While the exclusion of this potentially important indicator of Facebook Addiction from the scale was disappointing, qualitative data relating to online social enhancement among potential Facebook addicts can still be examined in order to provide further insights into the role that this symptom plays in Facebook Addiction. This will occur in Section 10.3.1.

10.1.3. Scoring. As two raters had been used to code for the presence or absence of Facebook Addiction symptoms, participants initially had two scores for

\(^{43}\) Interpretation of the kappa statistic is based on benchmarks provided by Landis and Koch (1977).

\(^{44}\) The lower level of agreement for online social enhancement was most likely due to a certain level of ambiguity in some of the responses, as well as the broadness of the coding criteria.
each of the seven potential indicators. In order to simplify the calculation of scores for the measure of Facebook Addiction, it was necessary to reduce these to one score for each potential symptom. In cases where raters had disagreed about the presence of a potential indicator of Facebook Addiction, that symptom was deemed to be absent and a score of ‘0’ was recorded. Frequencies for each indicator of a potential symptom of Facebook Addiction are displayed in Table 10.1.

Table 10.1

Frequencies (and Percentages) of Potential Indicators of Facebook Addiction Among the Total Sample (N = 417)

<table>
<thead>
<tr>
<th>Potential Symptom</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preoccupation</td>
<td>192 (56)</td>
</tr>
<tr>
<td>Mood Alteration</td>
<td>60 (17)</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>91 (27)</td>
</tr>
<tr>
<td>Negative Consequences</td>
<td></td>
</tr>
<tr>
<td>Personal Relationships</td>
<td>33 (8)</td>
</tr>
<tr>
<td>Daily Activities</td>
<td>207 (53)</td>
</tr>
<tr>
<td>Excessive Use</td>
<td>50 (13)</td>
</tr>
<tr>
<td>Self-identified recognition of potential Facebook Addiction</td>
<td>102 (26)</td>
</tr>
</tbody>
</table>

As illustrated in Table 10.1, approximately half of the participants in the sample reported preoccupation with Facebook, or interference with their daily activities because of Facebook. Around one quarter had experienced (or expected to experience) withdrawal from Facebook, or had recognised that their own Facebook use may be problematic. In contrast, only a small proportion of the sample reported using Facebook for the purposes of mood alteration, had problems within their personal relationships due to Facebook use, or had been told that they were using Facebook excessively. As mentioned in Chapter 9, the frequency of these symptoms is not thought to represent actual incidence in the general population. This is because the sample was deliberately biased towards heavy Facebook users, and the wording of the open-ended survey questions undoubtedly influenced the types of responses that were given.

In order to create a total score of potential Facebook Addiction, a sum of the
scores for each of the seven indicators was calculated. The distribution of scores is presented in Figure 10.1. As can be seen, the majority of the sample was scored as having zero, one, or two indicators of potential Facebook Addiction. The remaining participants had scores distributed across three, four, five, or six symptoms. No participants received a score of seven. This result shows a clear negative skew in the distribution of responses. Even though the recruitment criteria requested participation from individuals who felt that they use Facebook too much, it was likely that only a minority of participants would show evidence of multiple indicators of addiction. This is partly due to the fact that the questions were worded in a broad manner, and partly because the prevalence of online addictions is generally low (see Section 3.1).

![Figure 10.1. Distribution of scores on a preliminary measure of potential Facebook Addiction.](image)

A cut-off point of four was established for identifying potential addicts. This point was selected as: (a) it allowed for the inclusion of participants who scored higher than 75% of the entire sample, (b) it was over the halfway point in the distribution of scores (see Figure 10.1), and (c) it resulted in a sample of 59 potential Facebook addicts, which was an adequate sample size to allow further statistical analyses to be performed.
10.2. Descriptive Statistics for Potential Facebook Addicts

This section provides descriptive statistics for the subsample of participants who met the cut-off for Facebook Addiction. As the measure used in this study was only preliminary, these participants are classified from this point onward as potential Facebook addicts.

10.2.1. Demographics. Demographic frequencies for potential Facebook addicts are provided in Table 10.2. A large proportion of this sample were female, Australian, and aged between 24 and 35. These demographics are similar to those in the total sample (see Table 8.1); however, the sample of potential Facebook addicts contains a larger proportion of females (85% as compared to 69%).

Table 10.2

<table>
<thead>
<tr>
<th>Demographic</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>50</td>
<td>85</td>
</tr>
<tr>
<td>Male</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>Country of Residence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Australia</td>
<td>49</td>
<td>83</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Ireland</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Canada</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Age Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-23</td>
<td>9</td>
<td>16</td>
</tr>
<tr>
<td>24-29</td>
<td>18</td>
<td>30</td>
</tr>
<tr>
<td>30-35</td>
<td>20</td>
<td>34</td>
</tr>
<tr>
<td>36-41</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>42+</td>
<td>6</td>
<td>10</td>
</tr>
</tbody>
</table>

This result seems to support previous findings in this thesis (see Chapters 7 and 8) and in previous studies (McAndrew & Jeong, 2012; Thompson & Lougheed, 2012), that women were heavier Facebook users than men. However, it is in contrast
to the results of a Turkish study, which found that men were more likely than women to be addicted to Facebook (Çam & Işbulan, 2012; see Table 4.4). This divergence may be explained by the fact that different samples and methods for assessing Facebook Addiction were used in both studies (this will be explained further in Section 10.3).

10.2.2. Facebook usage. Table 10.3 summarises the prevalence of Facebook use variables including level of Facebook use, level of concern about personal Facebook use, and level of Facebook use on mobile devices. These frequencies are broken down by sex and age group. A discussion of the results for each Facebook usage variable is provided below.

10.2.2.1. Level of use. As Table 10.3 illustrates, 71% of potential Facebook addicts used Facebook either moderately (between 31 minutes and 2 hours a day), or heavily (between 2 and 4 hours a day). These results are identical to those reported in Phase 2 (see Table 7.3). This is an unsurprising outcome, given that Phase 2 participants were likely to be problematic Facebook users. In contrast, potential Facebook addicts demonstrated heavier Facebook use than the total sample of Phase 3 participants (see Table 8.3). Again, this result was predictable given that majority of the latter sample were not expected to be Facebook addicts.

In light of the trends towards heavy Facebook use among problematic samples (see Chapters 7 and 8), it is worth noting that 4% of potential addicts used Facebook for less than 30 minutes per day. As shown in Table 10.3, all of these individuals were men aged between 24 and 29 years. These results indicate that male potential Facebook addicts may be lighter users than those who are female, however the low number of men in this sample makes defending this assumption difficult. Furthermore, it could be argued that while excessive Facebook use may be a valid symptom of Facebook Addiction, it is not a reliable predictor for everyone (see Section 6.2.3.7). This assumption supports previous findings by Caplan (2010), and may suggest that there are different pathways to Facebook Addiction (see Chapter 11).

In terms of the association between daily Facebook use and age group, there were slight variations across level of use; the majority of 18-23 and 24-29 year olds used Facebook heavily, while the majority of 30-35 and 42+ year olds used Facebook moderately. The 36-41 year old age group showed the most substantial use, with 50% using Facebook heavily and 50% using Facebook very heavily. Again,
Table 10.3

Frequencies (and Percentages) of Facebook Usage Variables among Potential Facebook Addicts

<table>
<thead>
<tr>
<th>Facebook Usage Variable</th>
<th>Total $(n = 59)$</th>
<th>Sex</th>
<th>18-23 $(n = 9)$</th>
<th>24-29 $(n = 18)$</th>
<th>30-35 $(n = 20)$</th>
<th>36-41 $(n = 6)$</th>
<th>42+ $(n = 6)$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female $(n = 50)$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male $(n = 9)$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of Use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light</td>
<td>2 (4)</td>
<td>0 (0)</td>
<td>2 (22)</td>
<td>0 (0)</td>
<td>2 (11)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Moderate</td>
<td>20 (34)</td>
<td>16 (32)</td>
<td>4 (45)</td>
<td>3 (33)</td>
<td>5 (28)</td>
<td>9 (45)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Heavy</td>
<td>22 (37)</td>
<td>19 (38)</td>
<td>3 (33)</td>
<td>4 (45)</td>
<td>6 (33)</td>
<td>7 (35)</td>
<td>3 (50)</td>
</tr>
<tr>
<td>Very Heavy</td>
<td>15 (25)</td>
<td>15 (30)</td>
<td>0 (0)</td>
<td>2 (22)</td>
<td>5 (28)</td>
<td>4 (20)</td>
<td>3 (50)</td>
</tr>
<tr>
<td>Use on Mobile Devices</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Never</td>
<td>7 (12)</td>
<td>6 (12)</td>
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<td>2 (22)</td>
<td>1 (6)</td>
<td>2 (10)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Rarely</td>
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<td>1 (11)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Sometimes</td>
<td>8 (13)</td>
<td>6 (12)</td>
<td>2 (22)</td>
<td>0 (0)</td>
<td>4 (22)</td>
<td>3 (15)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Often</td>
<td>43 (73)</td>
<td>38 (76)</td>
<td>5 (56)</td>
<td>6 (67)</td>
<td>13 (72)</td>
<td>15 (75)</td>
<td>6 (100)</td>
</tr>
<tr>
<td>Level of Concern</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
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<td>1 (11)</td>
<td>3 (16)</td>
<td>0 (0)</td>
<td>1 (17)</td>
</tr>
<tr>
<td>Mild</td>
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<td>24 (48)</td>
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<td>8 (89)</td>
<td>6 (33)</td>
<td>9 (45)</td>
<td>3 (50)</td>
</tr>
<tr>
<td>Moderate</td>
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<td>16 (32)</td>
<td>2 (22)</td>
<td>0 (0)</td>
<td>7 (39)</td>
<td>8 (40)</td>
<td>2 (33)</td>
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<td>Very</td>
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<td>0 (0)</td>
<td>1 (6)</td>
<td>2 (10)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Extreme</td>
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<td>2 (4)</td>
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<td>0 (0)</td>
<td>1 (6)</td>
<td>1 (5)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Socially Motivated Use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>4 (7)</td>
<td>3 (6)</td>
<td>1 (11)</td>
<td>0 (0)</td>
<td>2 (11)</td>
<td>2 (10)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Disagree</td>
<td>1 (2)</td>
<td>1 (2)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>1 (6)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Neither Agree nor Disagree</td>
<td>6 (10)</td>
<td>6 (12)</td>
<td>0 (0)</td>
<td>2 (22)</td>
<td>0 (0)</td>
<td>4 (20)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Agree</td>
<td>29 (49)</td>
<td>24 (48)</td>
<td>5 (56)</td>
<td>4 (45)</td>
<td>8 (44)</td>
<td>11 (55)</td>
<td>3 (50)</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>19 (32)</td>
<td>16 (32)</td>
<td>3 (33)</td>
<td>3 (33)</td>
<td>7 (39)</td>
<td>3 (15)</td>
<td>3 (50)</td>
</tr>
</tbody>
</table>
given the low number of potential Facebook addicts in this age group, it is difficult to provide an in-depth analysis of these results; however, similar results were also shown in Phase 2 (see Section 7.3.1.1). Therefore, it may be the case that 36 to 41 year old heavy and very heavy Facebook users have more free time available for Facebook use (i.e., they are unemployed or stay-at-home parents), and are more motivated to use their time in this way (i.e., they are seeking social contact). This possibility will be explored further in Section 10.3.

10.2.2.2. Use on mobile devices. In regards to the use of Facebook on mobile devices, the majority of potential Facebook addicts did so often. This result was consistent across sex and age group. As the same trend was seen in Phase 2, and in the total sample in Phase 3 (see Table 8.3), it seems that using Facebook on mobile devices often may not be a useful differentiator between addicts and non-addicts. One notable result in Table 10.3 is that a high proportion (33%) of potential Facebook addicts aged 42 and over claimed to never use Facebook on mobile devices. As mentioned in Section 8.3.1.3, this is most likely because the penetration of smartphone use is lower among this particular demographic.

10.2.2.3. Level of concern. In regards to concern about Facebook use, the majority of potential Facebook addicts were only mildly concerned. This result differs from the total sample, as the majority of those participants had no concern at all. Furthermore, in comparison with the total sample, a higher proportion of potential Facebook addicts were moderately, very, and extremely concerned. This result demonstrates that many potential Facebook addicts had at least some level of self-awareness regarding their problematic Facebook use. In comparison with Phase 2 participants, however, the majority of potential Facebook addicts seemed to have lower levels of concerns. This result is likely due to the fact that having concern about Facebook use was an important inclusion criterion in Phase 2, but not for Phase 3.

Looking across demographic variables, the tendency for the majority of potential Facebook addicts to be mildly concerned was consistent, except in the 24-29 year old age range. The highest proportion of users in this age group (39%) were moderately concerned about their Facebook use. However, as only slightly fewer individuals (33%) were mildly concerned, these results are not strikingly different. It is worth noting that the only potential Facebook addicts who were extremely concerned about their Facebook use were females in the 24-29 and 30-35 year old age groups. These results are in contrast to the patterns of concern seen in Phase 2 (see Section 7.3.1.3), therefore, it is possible that age does not relate to level of concern.
10.2.2.4. Socially motivated use. Most of the potential Facebook addicts, regardless of sex or age, agreed that their Facebook use was motivated by a desire to be social. However, it should be noted that the majority of participants in the total sample all had the same opinion regarding their social use of Facebook (see Table 8.3). This lack of variance between the sample of potential Facebook addicts and the total sample may mean that using Facebook for social reasons is not a useful predictor of Facebook Addiction. This argument will be explored further in Section 10.3, which attempts to answer the remaining research questions by exploring more sophisticated statistical analyses.

10.3. Inferential Statistics

Having identified a subsample of participants who were potentially addicted to Facebook, it was then appropriate to use inferential statistical procedures to find answers to RQ4 and RQ5. As will be explained below, a two-step cluster analysis procedure was used to answer RQ4, while regression modelling was used to answer RQ5.

10.3.1. Cluster analysis. As outlined in Section 5.1, RQ4 asks whether Facebook Addiction takes different forms. In order to answer this question, two-step cluster analysis was performed. Cluster analysis is a multivariate method of data reduction that creates homogenous clusters of individuals by appraising inter-relationships between selected variables (Burns & Burns, 2008). Individuals within clusters are expected to be more similar to each other than they are to individuals in other clusters (Digre, Reece, Johnson, & Thomas, 2009). In this way, it was possible to examine whether groups of potential Facebook addicts engaged in certain patterns of activities that were distinct from other groups of potential Facebook addicts.

Although cluster analysis is an exploratory procedure (Burns & Burns, 2008), it is important that the selection of included variables is theoretically or conceptually justifiable (Mooi & Sarstedt, 2011). Generally, where researchers have discriminated between different types of Internet or Facebook Addiction (e.g., Davis, 2001; Griffiths, 2012; Young et al., 1998), they have done so according to the main type of activities engaged in (i.e., shopping, gambling, gaming). Therefore, for this particular cluster analysis, it seemed appropriate that the included variables were related to Facebook activities. As mentioned in Section 8.1.2.1, participants were asked an open-ended
question in the online survey about how they usually spent their time when they were using Facebook. Therefore, the first step in answering RQ4 was to perform a thematic analysis of the kinds of activities performed by potential Facebook addicts. The findings of the thematic analysis are presented in Table 10.4.

Table 10.4

<table>
<thead>
<tr>
<th>Theme</th>
<th>Example responses</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Browsing content</td>
<td>Checking updates, looking at photos</td>
<td>48</td>
<td>81</td>
</tr>
<tr>
<td>Social interaction</td>
<td>Commenting on friends' posts, replying to comments, chatting</td>
<td>43</td>
<td>73</td>
</tr>
<tr>
<td>Games</td>
<td>Playing games</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>Posting updates</td>
<td>Posting to my timeline</td>
<td>8</td>
<td>14</td>
</tr>
<tr>
<td>Shopping</td>
<td>Buying from Facebook based businesses</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Notifications</td>
<td>Checking for responses to my posts</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Competitions</td>
<td>Entering competitions</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

*The n refers to the number of participants who gave a response coded within this theme, and not the number of references.*

As Table 10.4 illustrates, seven themes emerged from the qualitative data relating to Facebook activities. Clearly, the strongest of these were *browsing content* and *social interaction*, which were endorsed by the majority of potential addicts. A smaller, but still sizable, proportion of this subsample mentioned regularly playing games on Facebook, posting updates, or shopping. In contrast, only a small proportion of the sample indicated that they regularly checked notifications or entered competitions on Facebook.

In order to increase the chances of obtaining a useful clustering solution, it is important that the sample size used in cluster analysis is substantially greater than the number of included variables. Formann (1984, cited in Mooi & Sarstedt, 2011) recommends that the sample size exceeds $2^m$, where $m$ represents the total number of included variables. Based on a sample size of 59, the optimum number of included variables according to Formann's guidelines was five. Therefore, the five most frequently endorsed variables (i.e., those endorsed by at least 10% of the sample) were included in the analysis: browsing content, social interactions, games, posting...
updates, and shopping.

When performing the cluster analysis, the clustering criterion of *Schwarz's Bayesian Criterion* was used in preference to *Akaike's Information Criterion*, as the latter tends to overestimate the number of clusters (Mooi & Sarstedt, 2011). In addition, a log-likelihood distance measure was used, and the number of clusters was determined automatically. The resulting outcome was a three-cluster solution, in which all participants were successfully incorporated. A summary of the profiles of individuals in each of the three clusters is presented below:

- **Cluster 1** was the largest cluster, comprising 30 (51%) individuals. Of the members of this cluster, 100% browsed content, 100% were socially active, and 10% posted updates. These individuals seem to be heavily involved in connecting and maintaining their existing social relationships on Facebook, through both engaging and observing. As such, this cluster was named *high social engagement, high browsing* (*HSE-HB*).

- **Cluster 2** consisted of 17 (29%) individuals, of which 100% browsed content on Facebook, 35% shopped, 18% engaged socially, 12% played games, and 6% updated. These individuals performed a variety of activities on Facebook, but seem to be primarily motivated by browsing content rather than actively engaging in social activities. This cluster was therefore referred to as *low social engagement, high browsing* (*LSE-HB*).

- **Cluster 3** was the smallest cluster, comprising only 12 (20%) individuals. Of the members of this cluster, 58% played games, 33% updated, 17% were social, and 8% browsed content. Unlike the other two clusters, individuals grouped into Cluster 3 did not appear to be primarily motivated by browsing Facebook for new content, nor did they appear to want to directly engage with their Facebook friends. Instead, the majority played games on Facebook. Therefore, this cluster was named *low social engagement, moderate gaming* (*LSE-MG*).

In order to provide a more complete picture of the kinds of individuals in each cluster, descriptive quantitative data were calculated and a thematic analysis of qualitative survey data was performed for each cluster. The thematic analysis was
performed according to the guidelines in Section 5.5. Frequencies for most\textsuperscript{46} of the quantitative variables are presented in Table 10.5. While inferential analyses were performed to look for differences between the clusters on each of the quantitative variables in Table 10.5, there were no significant results. As such, these results were not included. Instead, a discussion of the descriptive patterns associated with each cluster is presented below.

10.3.1.1. HSE-HB. The majority of individuals within the HSE-HB cluster were women aged between 24 and 35, who were heavy Facebook users, and often used the site on mobile devices. Most were only mildly concerned about their Facebook use, and either agreed or strongly agreed that they used Facebook to be social. In regards to the potential indicators of Facebook Addiction, this cluster had the highest proportion of individuals coded as experiencing preoccupation. Furthermore, the majority of individuals in this cluster had experienced interference with daily activities because of Facebook, recognised that they had a problem with Facebook use, and had experienced withdrawal. Less than half were coded as experiencing interference with personal relationships and excessive use. Moreover, this cluster had the lowest proportion of individuals who had experienced mood alteration.

The cluster analysis indicated that HSE-HB individuals were more sociable than members of the other two clusters, as they had the highest percentage of members who were socially active on Facebook. Based on the cluster analysis alone, it would make sense to argue that these individuals would have a preference for online social interaction, and use Facebook due to a desire for mood alteration (supporting Caplan’s [2010] social skill model; see Section 3.4.2). However, this argument is hard to defend given that individuals in the HSE-HB cluster had the lowest incidence of mood alteration of all three clusters. Examination of the results of the thematic analysis are therefore necessary to gain a more complete picture of why Facebook Addiction may occur among these cluster members.

The thematic analysis of data relating to socialising on Facebook indicated that at least half of the cluster members preferred to socialise on Facebook rather than face-to-face. This was mostly due to the fact that they felt greater levels of control over their Facebook interactions, as demonstrated in the following quotes:

\textsuperscript{46} Country of residence was excluded from the table as a high proportion of potential Facebook addicts were Australian (see Table 10.3).
Table 10.5

Frequencies and Percentages of Demographic, Facebook Usage, and Potential Facebook Addiction Variables for Cluster Members

<table>
<thead>
<tr>
<th>Variables</th>
<th>HSE-HB (n = 30)</th>
<th>LSE-HB (n = 17)</th>
<th>LSE-MG (n = 12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>25 (83)</td>
<td>13 (77)</td>
<td>12 (100)</td>
</tr>
<tr>
<td>Male</td>
<td>5 (17)</td>
<td>4 (23)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Age Group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-23</td>
<td>6 (20)</td>
<td>2 (12)</td>
<td>1 (8)</td>
</tr>
<tr>
<td>24-29</td>
<td>9 (30)</td>
<td>7 (41)</td>
<td>2 (17)</td>
</tr>
<tr>
<td>30-35</td>
<td>8 (26)</td>
<td>7 (41)</td>
<td>5 (42)</td>
</tr>
<tr>
<td>36-41</td>
<td>5 (17)</td>
<td>0 (0)</td>
<td>1 (8)</td>
</tr>
<tr>
<td>42+</td>
<td>2 (7)</td>
<td>1 (6)</td>
<td>3 (25)</td>
</tr>
<tr>
<td>Facebook Use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of Use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light</td>
<td>0 (0)</td>
<td>2 (12)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Moderate</td>
<td>8 (27)</td>
<td>8 (47)</td>
<td>4 (33)</td>
</tr>
<tr>
<td>Heavy</td>
<td>16 (53)</td>
<td>3 (18)</td>
<td>3 (25)</td>
</tr>
<tr>
<td>Very Heavy</td>
<td>6 (20)</td>
<td>4 (23)</td>
<td>5 (42)</td>
</tr>
<tr>
<td>Use on Mobile Devices</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>3 (10)</td>
<td>3 (18)</td>
<td>1 (8)</td>
</tr>
<tr>
<td>Rarely</td>
<td>1 (3)</td>
<td>0 (0)</td>
<td>0 (0)</td>
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<tr>
<td>Sometimes</td>
<td>2 (7)</td>
<td>5 (29)</td>
<td>1 (8)</td>
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<tr>
<td>Often</td>
<td>24 (80)</td>
<td>9 (53)</td>
<td>10 (84)</td>
</tr>
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<td>Level of Concern</td>
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<td></td>
</tr>
<tr>
<td>None</td>
<td>4 (13)</td>
<td>1 (6)</td>
<td>1 (8)</td>
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<tr>
<td>Mild</td>
<td>17 (57)</td>
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<td>Moderate</td>
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<td>5 (42)</td>
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<tr>
<td>Very</td>
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</tr>
<tr>
<td>Extreme</td>
<td>0 (0)</td>
<td>1 (6)</td>
<td>1 (8)</td>
</tr>
<tr>
<td>Socially Motivated Use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>3 (10)</td>
<td>1 (6)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Disagree</td>
<td>1 (3)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Neither Agree nor Disagree</td>
<td>3 (10)</td>
<td>2 (12)</td>
<td>1 (8)</td>
</tr>
<tr>
<td>Agree</td>
<td>13 (44)</td>
<td>9 (53)</td>
<td>7 (59)</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>10 (33)</td>
<td>5 (29)</td>
<td>4 (33)</td>
</tr>
<tr>
<td>Potential Indicators of Facebook Addiction</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Preoccupation</td>
<td>27 (90)</td>
<td>14 (82)</td>
<td>10 (83)</td>
</tr>
<tr>
<td>Mood Alteration</td>
<td>37 (11)</td>
<td>4 (24)</td>
<td>4 (33)</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>19 (63)</td>
<td>13 (77)</td>
<td>7 (58)</td>
</tr>
<tr>
<td>Negative Consequences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal relationships</td>
<td>14 (47)</td>
<td>6 (35)</td>
<td>7 (58)</td>
</tr>
<tr>
<td>Interfered daily activities</td>
<td>28 (93)</td>
<td>14 (82)</td>
<td>12 (100)</td>
</tr>
<tr>
<td>Excessive use</td>
<td>14 (47)</td>
<td>8 (47)</td>
<td>8 (67)</td>
</tr>
<tr>
<td>Self-recognition of problem</td>
<td>25 (83)</td>
<td>15 (88)</td>
<td>9 (75)</td>
</tr>
</tbody>
</table>
“[Facebook offers the] ability to remove what I have posted if I believe I made an error, within a few minutes of posting it.” (Male, 18, Heavy)

“[On Facebook] you can choose when you want to talk to people. If you don’t feel like responding straight away you don’t have to.” (Female, 29, Heavy)

While this desire for social control on Facebook may point to the existence of social anxiety or shyness (see Section 9.2.6.1), there were few comments to directly support this assumption. In addition, only three members of this cluster mentioned using Facebook due to loneliness, in contrast to expectations based on the social skill model (Caplan, 2010). Furthermore, quotes relating to preoccupation with Facebook revealed that the thoughts experienced by individuals in the HSE-HB cluster were overwhelmingly associated with a desire to know whether new content has been posted, rather than thoughts about posting social content or reaching out to contact others (i.e., through Chat or Messages). For example:

“I am eager to know what others are doing [on Facebook] so I check the news feed over and over again” (Male, 19, Moderate)

“[When not using Facebook I think that I] need to check it for messages/posts” (Female, 25, Moderate)

“[When not using Facebook] I wonder if I have any notifications” (Female, 34, Heavy)

It seems then that individuals in this cluster may use Facebook to avoid loneliness, but they have a strong desire to keep abreast of what is happening in this online social space. This may be because they feel more comfortable conversing with friends using Facebook and, therefore, have immersed themselves more than others in their online social life. However, further research is needed to support this assumption.

As individuals in this cluster seemed enthusiastic about checking Facebook for new content, it is unsurprising that the majority (63%) had experienced (or could imagine experiencing) withdrawal from Facebook when they were not using it. Several individuals in this cluster referred directly to experiencing ‘withdrawal’, while others mentioned negative feelings, such as stress and anxiety. Individuals in this cluster were also the most likely to admit that without Facebook they felt (or would feel) like they were missing out:
“[Without Facebook] I felt like I was ‘missing’ out on something” (Female, 37, Heavy)

“[Without Facebook I felt] annoyed, as though I were missing out on things” (Female, 32, Moderate)

It is also unsurprising that regular Facebook checking seems to lead to negative consequences for these cluster members; 93% admitted experiencing interference with daily activities. Thematic analysis revealed that work and study were the activities most commonly interrupted to use Facebook. In contrast, less than half of the individuals in this cluster admitted that Facebook had caused problems in their relationships. Of those who did, several referred to the fact that their husbands did not like the fact that they often checked Facebook on their phones:

“My husband doesn’t use FB and he says I’m always looking at my phone.” (Female, 30, Heavy)

“My husband says I frequently zone out while he is talking to me only to jump on my smart phone to check Facebook” (Female, 24, Very Heavy)

Furthermore, a high proportion of this sample seemed to recognise that they had a problem with Facebook use, and most of the comments related to excessive use or loss of control. For example:

“I use [Facebook] a lot. I’m not concerned about what I do on there, just how much I am on it, just to check for updates.” (Female, 30, Moderate)

“I think I may be addicted to Facebook. I need to step away from it for a while I think” (Female, 34, Heavy)

In sum, the evidence presented here suggests that there are a group of Facebook addicts who feel comfortable interacting on Facebook, and are highly preoccupied with monitoring what is happening on the site. As a result, these individuals feel as though they are missing out when they do not check Facebook regularly, and this interferes with their ability to complete daily activities. Further research should ascertain whether this cluster is replicable, and if so, whether online social enhancement is relevant to the development of this type of addiction. Other unique indicators may also be involved; for example, social obligation to respond to Facebook updates and messages (as discussed in Section 9.3.5).

10.3.1.2. LSE-HB. While individuals in the LSE-HB cluster were
predominantly women, it is worth noting that this cluster contained the highest proportion of men (23%). This cluster also contained the highest proportion of individuals aged 24-35. Most LSE-HB members were moderate Facebook users, who often used the site on mobile devices, and had mild to moderate levels of concern about their use. The majority of members either agreed or strongly agreed that they used Facebook to be social. In regard to the potential indicators of Facebook Addiction, this cluster had the highest proportion of individuals who experienced withdrawal, and who recognised that they had a problem with Facebook. Furthermore, the majority were coded as experiencing both preoccupation and interference with daily activities due to Facebook use. Under half of the cluster admitted being excessive users, that Facebook had interfered with their personal relationships, and that they used Facebook for the purposes of mood alteration.

Thematic analysis of the qualitative survey responses of LSE-HB members revealed that, like those in the HSE-HB cluster, preoccupation with Facebook stemmed from a desire to know what is happening on Facebook, and whether there have been any updates.

“[When not using Facebook I am] wondering who has posted.” (Female, 48, Very Heavy)

“[When not using Facebook I wonder] what have I missed?” (Female, 30, Very Heavy)

Given that these sorts of thoughts were common in both LSE-HB and HSE-HB clusters, it is clear that preoccupation leads to high engagement with browsing Facebook, which may cause interference with daily activities. In fact, individuals in this cluster were the most likely to use the word ‘distract’ when commenting about their Facebook use:

“[Facebook is] always distracting me from work.” (Female, 48, Very Heavy)

“[Facebook is a] constant distraction from study” (Female, 28, Heavy)

“[Facebook] can make me very lazy and distracted from the housework” (Female, 30, Moderate)

However, unlike members of the HSE-HB cluster, individuals in this cluster did not commonly refer to feeling more comfortable interacting socially on Facebook when
compared to face-to-face. Instead, their comments referred to the fact that Facebook communication was less intimate, less private, and more superficial.

Rather than being motivated to use Facebook for social reasons, it seems that LSE-HB members tend to use Facebook when they were feeling bored. Some individuals recognised this pattern of behaviour, and acknowledged that it led to excessive use:

“*I’m concerned I use [Facebook] a fair bit, but I wouldn’t need to use it if I had other things to occupy my time.*” (Male, 25, Moderate)

“I *do feel I use [Facebook] too much, especially when I’m bored.*” (Female, 33, Moderate)

“I *think I spend too much time on [Facebook] but I have nothing else to do.*” (Female, 25, Very Heavy)

This desire to use Facebook when bored could explain why these potential Facebook addicts used Facebook more broadly (i.e., for shopping and games) than members of the previous cluster. As such, these individuals may be likely to develop Facebook Addiction through the motivation of passing time (see Section 4.4.4.1). Not having access to Facebook did seem to lead to withdrawal from these individuals; the qualitative data revealed that they were likely to feel (or could imagine feeling) lost without Facebook, or that they were missing out. Some also mentioned negative emotions, such as anxiety and urges to check.

It is worth noting that few members of this cluster mentioned that Facebook use had caused problems with their personal relationships. Therefore, it seems that these individuals are less likely than HSE-HB members to browse or use Facebook in company. This would make sense, given that they seem to be primarily motivated by boredom. However, when engaging in important tasks, such as study or work, they seem to be more prone to distraction than individuals in other clusters. This type of Facebook Addiction appears to correspond with the findings related to habitual Facebook use (i.e., Foregger, 2008; LaRose et al., 2010; Sheldon, 2008) discussed in Section 4.5.1. Further research should aim to find supporting evidence for the existence of this cluster, and to assess whether it is related to habitual Facebook use for passing time.

10.3.1.3. LSE-MG. The LSE-MG cluster comprised entirely of women, and the majority were aged 24-35. It is worth noting that this cluster had the highest
proportion of members aged 42 and over, were generally very heavy users, and most often used Facebook on mobile devices. The majority of these individuals were mild to moderately concerned about their Facebook use. In terms of the potential indicators of Facebook Addiction, the majority of members were coded as having experienced all of the potential indicators except mood alteration. Despite this, these cluster members had the highest incidence of mood alteration among all of the clusters. Furthermore, this cluster also had the highest proportion of members who were excessive users, and who admitted that Facebook interfered with their Facebook activities and caused problems with their personal relationships. These descriptive data suggest that this cluster most closely fits the profile of Facebook Addiction, based on the indicators examined within this study.

Based on the qualitative data from this subset of participants it seems that these individuals were the most likely to feel that Facebook communication was more comfortable than communicating offline:

“I am more ‘outgoing’ online and shy in person” (Female, 33, Very Heavy)

“Facebook socialising is more intimate in terms of information exchange”  
(Female, 44, Heavy)

“It’s easier to be open with some of my FB friends” (Female, 33, Heavy)

It was also apparent that these individuals tended to use Facebook when they were bored or lonely:

 “[I usually use Facebook when] I am procrastinating, bored. (Female, 34, Moderate)

“I only use FB when I’m on my own and am bored and/or lonely. When I’m with friends or family, I’m happy to be in their company and don’t consider checking FB. When I’m on my own, I feel the need to “fill the void” with my FB games and photos.” (Female, 39, Very Heavy)

These cluster members elected to use Facebook instead of other performing other activities:

“There are definitely times when I should be outside enjoying the sunshine, enjoying my family, and doing study and/or chores, but instead I’m cooped up inside tapping away [on Facebook].” (Female, 39, Very Heavy)
“I literally can’t go an hour without being on [Facebook]. I spent way too much time on there also during the day. Facebook wasn’t around when I had my first child and I used to spend a lot less time on the computer and more time doing activities when him than I do my current baby. I am aware of my behaviour but can’t seem to let it go.” (Female, 33, Very Heavy)

This excessive use was commonly leading to negative consequences, such as failure to complete housework and tension with male romantic partners:

“[I] spend lots of time on [Facebook] so dinner isn’t cooked.” (Female, 33, Very Heavy)

“*My husband thinks I spend too much time on Facebook, and that I would get more done around the house if I wasn’t always on the computer.*” (Female, 33, Heavy)

While these individuals seem to fit within the social skill model of online addiction (Caplan, 2010), it is worth noting that they were the least likely to mention engaging in social activities on Facebook. Instead, they were more frequently involved in playing games and updating their profiles than members of other clusters. In Chapter 7, it was noted that there was a high proportion of individuals aged over 36 who were using Facebook heavily. These individuals were the most likely to mention that they were concerned about their game-playing on Facebook. As shown in Table 10.2, the LSE-MG cluster contained the highest proportion of individuals aged over 42 years, which may indicate that there is a pattern of problematic Facebook use for users of this age group. Smith (2013) noted a similar this pattern in her study of Facebook gamers, and concluded that older adults are more likely to use Facebook games to engage in mood alteration and online social enhancement.

Although the qualitative data in this cluster was limited (due to the low sample size), this group of potential Facebook addicts may be using Facebook excessively because they are prone to boredom. As stated in Section 9.3.2, boredom has been found to be a motivator among gaming addicts. This boredom may stem from the fact that these individuals have large amounts of unstructured time available to them (i.e., they are unemployed or stay-at-home parents). For example, most of the LSE-MG members admitted that Facebook interfered with their ability to study, complete housework, or spend time with their children. In contrast, the responses from individuals in the other clusters more commonly mentioned Facebook interfering with work. However, as data relating to employment status was not collected in any phase
of this study, more research is needed to confirm these patterns.

Further discussion relating to these results, and those of the other clusters, is presented in Chapter 11. The focus of this chapter now turns to answering RQ5.

10.3.2. Regression modelling. To answer RQ5, which asked whether there were certain predictors of Facebook Addiction, regression modelling was used. To employ this technique, it was necessary to compare the group of potential Facebook addicts with a group of non-addicts. A new dataset was created in PASW Statistics GradPack 18 (SPSS, 2009), which combined the responses from the 59 potential Facebook addicts with a sample of non-Facebook addicts. The latter group was derived from the 103 participants who scored zero on the preliminary measure of Facebook Addiction (see Figure 10.1).

As the dependent variable in the regression model - Facebook Addiction - was a binary categorical variable, it was necessary to proceed with the analysis using binary logistic regression (Field, 2009). For the purposes of this analysis, the potential predictors that could be used to build the model were the demographic variables (sex and age), the Facebook usage variables (level of Facebook use, level of Facebook use on mobile devices), and Facebook attitudinal variables (socially motivated use and level of concern). According to guidelines provided by Field (2009), these variables were tested for multicollinearity, and none were found to violate this assumption (see Appendix H).

Hosmer, Lemeshow, and Sturdivant (2013) advise that when there are multiple variables available with which to build a regression model, it is best to determine which of them would result in the most parsimonious model. Therefore, those authors provide a set of guidelines for conducting a purposeful selection of predictors. The first step in the process is to determine whether there is a statistically significant association between the dependent variable and each of the potential predictors. Hosmer et al. recommend using Pearson's chi-square test to examine categorical variables, and univariable logistic regression for continuous variables. As age was the only continuous variable, a single univariable logistic regression analysis was performed (see Table 10.6). The remaining predictors were all categorical, so a series of Pearson's chi-square tests were performed (see Table 10.7). As illustrated, all of the independent variables were statistically significant; however based on the effect sizes and odds ratios, sex, level of Facebook use, and level of concern showed the strongest associations with potential Facebook Addiction.
Table 10.6

**Association Between Age and Potential Facebook Addiction**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$B$ (SE)</th>
<th>Wald</th>
<th>$p$</th>
<th>Exp($B$)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-0.05 (.02)</td>
<td>6.51</td>
<td>.01</td>
<td>0.95</td>
<td>0.92, 0.99</td>
</tr>
<tr>
<td>Constant</td>
<td>1.04 (0.64)</td>
<td>2.70</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. $R^2 = .05$ (Cox & Snell), .06 (Nagelkerke). Model $\chi^2 (1) = 7.40, p = .007.*

The second step outlined by Hosmer et al. (2013) is to run a multivariable logistic regression analysis using all of the predictors that were individually statistically significant with a $p$-value less than 0.25. In the present study, all of the predictors in Tables 10.6 and 10.7 met this requirement; therefore, all were included in the multivariable regression analysis. The results of this procedure are displayed in Table 10.8. The overall model was significant, $\chi^2 (16) = 134.58, p < .001, R^2 = .56$ (Cox & Snell), .77 (Nagelkerke), and predicted 91% of non-addicts and 86% of addicts correctly. However, as shown, level of concern about Facebook use, level of Facebook use, and age were the only variables in the model that contributed significant levels of unique variance toward the classification of group membership.

The third step recommended by Hosmer et al. (2013) involves conducting a hierarchical regression analysis, in which all of the variables that were significant in the initial model (age, level of use, level of concern) are added in one block, and all of the non-significant variables (sex, socially motivated use, use on mobile devices) are added in a second block. During this process, a partial likelihood ratio test was performed to compare whether the reduced model was significantly different to the full model. The results revealed that there was no significant difference between the two models, $\chi^2 (8) = 14.81, p = .06$. This implies that the reduced model predicts potential Facebook Addiction as effectively as the full model.

In addition to the partial likelihood ratio test, Hosmer et al. (2013) also recommend looking at the difference between individual predictors in the reduced and full models. These results are displayed in Table 10.9. As shown, there were no substantial changes between the Wald statistics and $p$ values for level and use and level of concern across the two models. However, while age was a significant predictor in the full model, it was no longer significant in the reduced
Table 10.7

**Associations Between Categorical Variables and Potential Facebook Addiction**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$\chi^2$</th>
<th>$p$</th>
<th>$\varphi$</th>
<th>Non-Addicts</th>
<th>Potential Addicts</th>
<th>Odds Ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Observed</td>
<td>Expected</td>
<td>Observed</td>
<td>Expected</td>
</tr>
<tr>
<td>Sex</td>
<td>20.81</td>
<td>&lt;.001</td>
<td>.36</td>
<td>53</td>
<td>39.4</td>
<td>9</td>
<td>22.6</td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td></td>
<td></td>
<td>50</td>
<td>63.6</td>
<td>50</td>
<td>36.4</td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of Use</td>
<td>55.06</td>
<td>&lt;.001</td>
<td>.58</td>
<td>46</td>
<td>30.5</td>
<td>2</td>
<td>17.5</td>
</tr>
<tr>
<td>Light</td>
<td></td>
<td></td>
<td></td>
<td>45</td>
<td>41.3</td>
<td>20</td>
<td>23.7</td>
</tr>
<tr>
<td>Moderate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heavy</td>
<td>6</td>
<td>17.8</td>
<td>22</td>
<td>10.2</td>
<td>84.33</td>
<td>15.73</td>
<td>452.05</td>
</tr>
<tr>
<td>Very Heavy</td>
<td>6</td>
<td>13.4</td>
<td>15</td>
<td>7.6</td>
<td>57.50</td>
<td>10.47</td>
<td>315.73</td>
</tr>
<tr>
<td>Use on Mobile Devices</td>
<td>10.79</td>
<td>.013</td>
<td>.26</td>
<td>19</td>
<td>16.5</td>
<td>7</td>
<td>9.5</td>
</tr>
<tr>
<td>Never</td>
<td></td>
<td></td>
<td></td>
<td>16</td>
<td>10.8</td>
<td>1</td>
<td>6.2</td>
</tr>
<tr>
<td>Rarely</td>
<td></td>
<td></td>
<td></td>
<td>15</td>
<td>14.6</td>
<td>8</td>
<td>8.4</td>
</tr>
<tr>
<td>Sometimes</td>
<td>53</td>
<td>61.0</td>
<td>43</td>
<td>35.0</td>
<td>2.20</td>
<td>0.85</td>
<td>5.73</td>
</tr>
<tr>
<td>Socially Motivated Use</td>
<td>11.20</td>
<td>.024</td>
<td>.26</td>
<td>2</td>
<td>3.8</td>
<td>4</td>
<td>2.2</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>2.5</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>Disagree</td>
<td>26</td>
<td>20.3</td>
<td>6</td>
<td>11.7</td>
<td>0.12</td>
<td>0.12</td>
<td>0.78</td>
</tr>
<tr>
<td>Neither Agree nor Disagree</td>
<td>55</td>
<td>53.4</td>
<td>29</td>
<td>30.6</td>
<td>0.26</td>
<td>0.05</td>
<td>1.53</td>
</tr>
<tr>
<td>Agree</td>
<td>17</td>
<td>22.9</td>
<td>19</td>
<td>13.1</td>
<td>0.56</td>
<td>0.09</td>
<td>3.45</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of Concern</td>
<td>89.52</td>
<td>&lt;.001</td>
<td>.74</td>
<td>88</td>
<td>59.8</td>
<td>6</td>
<td>34.2</td>
</tr>
<tr>
<td>None</td>
<td></td>
<td></td>
<td></td>
<td>10</td>
<td>25.4</td>
<td>30</td>
<td>14.6</td>
</tr>
<tr>
<td>Mild</td>
<td>2</td>
<td>12.7</td>
<td>18</td>
<td>7.3</td>
<td>132.00</td>
<td>24.63</td>
<td>707.34</td>
</tr>
<tr>
<td>Moderate</td>
<td>2</td>
<td>3.2</td>
<td>3</td>
<td>1.8</td>
<td>22.00</td>
<td>3.07</td>
<td>157.92</td>
</tr>
<tr>
<td>Very</td>
<td>1</td>
<td>1.9</td>
<td>2</td>
<td>1.1</td>
<td>29.33</td>
<td>2.32</td>
<td>371.53</td>
</tr>
<tr>
<td>Extreme</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* In all cases, the first level of each category was used to calculate the odds ratio. CI = confidence interval.
Table 10.8

**Initial Multivariable Regression Model Predicting Potential Facebook Addiction**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>B (SE)</th>
<th>Wald</th>
<th>p</th>
<th>Exp(B)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-0.09 (0.04)</td>
<td>4.94</td>
<td>.03</td>
<td>0.91</td>
<td>0.84, 0.99</td>
</tr>
<tr>
<td><strong>Sex (comparison category: Male)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1.40 (0.76)</td>
<td>3.36</td>
<td>.07</td>
<td>4.05</td>
<td>0.91, 18.10</td>
</tr>
<tr>
<td><strong>Level of Use (comparison category: Light)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>2.24 (1.29)</td>
<td>3.01</td>
<td>.08</td>
<td>9.42</td>
<td>0.74, 111.70</td>
</tr>
<tr>
<td>Heavy</td>
<td>4.00 (1.47)</td>
<td>7.41</td>
<td>.006</td>
<td>54.33</td>
<td>3.06, 964.69</td>
</tr>
<tr>
<td>Very Heavy</td>
<td>2.92 (1.48)</td>
<td>3.86</td>
<td>.05</td>
<td>18.49</td>
<td>1.01, 339.10</td>
</tr>
<tr>
<td><strong>Use on Mobile Devices (comparison category: Never)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rarely</td>
<td>-1.55 (1.71)</td>
<td>0.83</td>
<td>.36</td>
<td>.21</td>
<td>0.01, 6.06</td>
</tr>
<tr>
<td>Sometimes</td>
<td>0.19 (1.24)</td>
<td>0.02</td>
<td>.88</td>
<td>1.21</td>
<td>0.11, 13.79</td>
</tr>
<tr>
<td>Often</td>
<td>-0.71 (1.00)</td>
<td>0.50</td>
<td>.48</td>
<td>0.49</td>
<td>0.07, 3.52</td>
</tr>
<tr>
<td><strong>Socially Motivated Use (comparison category: Strongly Disagree)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disagree</td>
<td>-4.87 (2.60)</td>
<td>3.51</td>
<td>.06</td>
<td>0.01</td>
<td>0.00, 1.26</td>
</tr>
<tr>
<td>Neither Agree nor Disagree</td>
<td>-4.30 (1.65)</td>
<td>6.77</td>
<td>.009</td>
<td>0.01</td>
<td>0.00, 0.35</td>
</tr>
<tr>
<td>Agree</td>
<td>-2.48 (1.45)</td>
<td>2.95</td>
<td>.09</td>
<td>0.08</td>
<td>0.01, 1.42</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>-2.00 (1.45)</td>
<td>1.90</td>
<td>.17</td>
<td>0.14</td>
<td>0.01, 2.33</td>
</tr>
<tr>
<td><strong>Level of Concern (comparison category: None)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>3.59 (0.75)</td>
<td>23.03</td>
<td>&lt;.001</td>
<td>36.28</td>
<td>8.37, 157.25</td>
</tr>
<tr>
<td>Moderate</td>
<td>4.42 (0.99)</td>
<td>19.95</td>
<td>&lt;.001</td>
<td>83.00</td>
<td>11.94, 577.01</td>
</tr>
<tr>
<td>Very</td>
<td>2.62 (1.50)</td>
<td>3.06</td>
<td>.08</td>
<td>13.70</td>
<td>0.73, 257.74</td>
</tr>
<tr>
<td>Extreme</td>
<td>5.07 (4.50)</td>
<td>1.27</td>
<td>.26</td>
<td>158.45</td>
<td>0.02, 1080.00</td>
</tr>
</tbody>
</table>
model. As such, it was assumed that one of the excluded variables (i.e., sex, socially motivated use, or use on mobile devices) contributed to the significant result of age in the full model (Hosmer et al., 2013).

To test the above assumption, it was necessary to select a variable to add back into the model. Out of the three non-significant variables in the full model (see Table 10.8), sex had the lowest significance level ($p = .07$). In addition, it was expected that sex was relevant to the development of Facebook Addiction, as the majority of potential Facebook addicts were female. As such, the hierarchical procedure described above was rerun, with sex included as a predictor in the reduced model. Once again, there was no significant difference between the reduced and the full model, $\chi^2 (7) = 10.58$, $p = .16$. In addition, all of the included variables had significant Wald values. Therefore, this model was considered to be the most appropriate for predicting Facebook Addiction. The results of the final parsimonious model are shown in Table 10.10.

The overall model was significant, $\chi^2 (9) = 124.00$, $p < .001$, $R^2 = .54$ (Cox & Snell), .73 (Nagelkerke), and predicted 90% of non-addicts and 86% of addicts correctly. Although this model does not predict a higher proportion of Facebook addicts than the previous model, it does include a smaller number of predictors, and thus, is more parsimonious. As stated by Hosmer et al. (2012), this is a desirable outcome. The final model indicates that potential Facebook Addiction can be well predicted by age, sex, level of daily Facebook use, and level of concern about Facebook use. More specifically, being young, being female, being a moderate, heavy, or very heavy level of daily Facebook use, and level of concern about

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Full Model</th>
<th>Reduced Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wald</td>
<td>$p$</td>
</tr>
<tr>
<td>Age</td>
<td>4.94</td>
<td>.03</td>
</tr>
<tr>
<td>Level of Use</td>
<td>8.49</td>
<td>.04</td>
</tr>
<tr>
<td>Level of Concern</td>
<td>30.46</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Table 10.9

Comparison of Wald Statistic and Significance Level for Age, Level of Use, and Level of Concern Across Full and Reduced Regression Models.
Table 10.10

**Final Parsimonious Multivariable Regression Model Predicting Potential Facebook Addiction**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>B (SE)</th>
<th>Wald</th>
<th>p</th>
<th>Exp(B)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-0.07 (0.35)</td>
<td>4.20</td>
<td>.04</td>
<td>0.93</td>
<td>0.87, 1.00</td>
</tr>
<tr>
<td>Sex (comparison category: Male)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1.34 (0.67)</td>
<td>3.94</td>
<td>.05</td>
<td>3.80</td>
<td>1.02, 14.24</td>
</tr>
<tr>
<td>Level of Facebook Use (comparison category: Light)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>2.08 (1.04)</td>
<td>4.02</td>
<td>.05</td>
<td>8.01</td>
<td>1.05, 61.18</td>
</tr>
<tr>
<td>Heavy</td>
<td>3.51 (1.16)</td>
<td>9.10</td>
<td>.003</td>
<td>33.28</td>
<td>3.41, 324.51</td>
</tr>
<tr>
<td>Very Heavy</td>
<td>2.80 (1.20)</td>
<td>5.44</td>
<td>.02</td>
<td>16.28</td>
<td>1.56, 169.97</td>
</tr>
<tr>
<td>Level of Concern (comparison category: No Concern)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>3.08 (0.63)</td>
<td>24.27</td>
<td>&lt;.001</td>
<td>21.75</td>
<td>6.39, 74.05</td>
</tr>
<tr>
<td>Moderate</td>
<td>4.63 (1.01)</td>
<td>20.85</td>
<td>&lt;.001</td>
<td>102.11</td>
<td>14.02, 743.78</td>
</tr>
<tr>
<td>Very</td>
<td>1.39 (1.09)</td>
<td>1.62</td>
<td>.20</td>
<td>4.01</td>
<td>0.47, 34.05</td>
</tr>
<tr>
<td>Extreme</td>
<td>3.61 (2.21)</td>
<td>2.67</td>
<td>.10</td>
<td>37.05</td>
<td>0.49, 2821.00</td>
</tr>
</tbody>
</table>

Facebook use. More specifically, being young, being female, being a moderate, heavy, or very heavy Facebook user, and having mild, moderate, or extreme levels of concern about Facebook use are all predictive of Facebook Addiction. These results will now be discussed further.

10.3.2.1. Age. In regards to age, previous research supports the finding that being a young adult is a predictor of Facebook Addiction. For example, Murphy (2013) discovered that adults aged 18-24 years old were more likely to spend greater amounts of time on Facebook than adults aged over 24 years. Similarly, McAndrew and Jeong (2012) found that young Facebook users were more likely to spend a greater number of hours per week on Facebook, and engage in a wider range of activities than older users. More specifically, younger Facebook users were more likely than older user to post content, look at photos, interact with groups, spend time looking at the profile pages of friends, and engage in social comparison.

These results indicate that younger people have a greater predilection for Facebook than older people. One potential reason for this is that young adults tend to have larger social networks than older adults; a recent meta-analysis indicated that
the size of global, personal, and friendship networks expands in adolescence and young adulthood, before reducing as age increases (Wrzus, Hanel, Wagner & Neyer, 2013). The authors explained this finding using *socio-emotional selectivity theory*, which states that younger people maintain larger social networks for the purposes of information seeking, while older adults tend to cease contact with individuals on the periphery of their networks and focus instead on maintaining close relationships. This may also apply to Facebook friendship networks; McAndrew and Jeong (2012) found that there was a significant negative correlation between age and number of Facebook friends. Unfortunately, limited research focusing on age differences in Facebook use makes this argument difficult to justify. Researchers should aim to examine wider samples when studying Facebook use, rather than primarily relying on university students (Ryan & Xenos, 2011).

Another factor that may contribute to Facebook Addiction among younger adults is that they may be more likely to be unemployed or studying than Facebook users in middle or later adulthood. As a result, they could be more prone to leisure boredom. This is another variable worth considering in future studies of Facebook Addiction. Similarly, it may be the case that older Facebook addicts are also motivated by leisure boredom. This argument was previously put forward to explain why the LSE-MG cluster of potential Facebook addicts contained a high proportion (25%) of women over the age of 42 (see Table 10.5). Rather than being unemployed or students, these women may be stay-at-home mothers whose children are at school, and who are seeking entertainment or social connection during the day. While there was some preliminary evidence of this in the qualitative data, further supporting research is required.

10.3.2.2. Sex. The inclusion of sex in the model was unsurprising, as the vast majority (85%) of potential addicts identified in Chapter 10 were women. Based on these results, there is a strong argument that women are more at-risk of becoming addicted to Facebook than men. Partial support for this argument has also been reported by Thomson and Lougheed (2012), as their study indicated that women were more likely to feel withdrawal, loss of control, and addiction to Facebook. However, in contrast to the findings reported here, Çam and İşbulan (2012) found that more men than women were addicted to Facebook. While there are certainly cultural differences between the samples used in this thesis and that recruited by Çam and İşbulan, the divergent findings may be primarily due to the different approaches to measurement that were taken.
Çam and Işbulan (2012) used a modified version of the IAT to measure Facebook Addiction, and as previously noted (see Table 6.3), this measure only encompasses three of the core symptoms identified in Phase 1: withdrawal, negative consequences, and excessive use. In contrast, the present study measured potential Facebook Addiction based on evidence of preoccupation, negative consequences, withdrawal, mood alteration, excessive use, and self-identified recognition of problematic Facebook use. Therefore, it is possible that the present study provided more accurate results; however, as the research performed in this thesis is exploratory, further studies are needed to confirm that this is the case.

It is worth noting that if women are at higher risk of Facebook Addiction than men, this trend contradicts findings related to Internet Addiction. As Table 3.4 clearly shows, the prevalence of the latter disorder is consistently higher among men, regardless of country of residence, age, or type of measurement. Therefore, it seems that the development of Facebook Addiction may be tied to different motivations than Internet Addiction. If so, this adds to the argument that Facebook Addiction should be studied separately from Internet Addiction.

While research is just beginning to identify sex differences in relation to Facebook use, it is important to establish why these differences may be occurring. Given the social motivations linked to Facebook use, it is likely that differences in social behaviour may be highly germane to this topic. For example, women and men are known to cultivate friendships with others in different ways. Caldwell and Peplau (1982) found that women are likely to have intimate friendships based on emotional self-disclosure. Men, on the other hand, were more likely to have friendships based on shared activities or interests. It is possible that women might be more likely than men to seek out intimate interactions with their friends on Facebook. In this way, women may become heavier users Facebook than men.

Research has also shown that women are more likely to engage in social comparison than men, and that this trend can be stronger in Western cultures (Guimond et al., 2007). Clearly, Facebook increases the ease with which users can engage in social comparison with others. In fact, Lee (2014) found that there was a significant relationship between having a high inclination for social comparison and using Facebook heavily. Furthermore, McAndrew and Jeong (2012) reported that women were more likely than men to use Facebook to engage in social comparison with same-sex friends. However, this trend was not explored in this thesis, and there is little evidence linking social comparison with the development of addiction.
Therefore, further research should determine why women might be more prone to developing Facebook Addiction than men.

10.3.2.3. Level of use. Given that excessive use was proposed as a core symptom of Facebook Addiction, it is unsurprising that level of use was included in the model. However, in Section 8.3.1.2, it was argued that excessive use should be considered as a subjective perception based on individuals’ own self-expectations and life experiences. This notion was supported by the descriptive results in Table 8.5, which illustrated that the majority of heavy and very heavy users had either no concern or mild concerns about their own Facebook use. If this is the case, excessive use should be measured through self-report, rather than adhering to a particular cut-off point suggested by researchers. Therefore, the level of use variable discussed here differs from the symptom of excessive use that was used to measure potential Facebook Addiction.

Examination of the results in this thesis demonstrates that individuals who engage in greater levels of Facebook use were predominantly women and younger adults. There was also a significant association found between level of concern and level of Facebook use (see Section 8.3.1.4). However, as the relationships between level of use and these three variables are discussed individually in other subsections, there is no need to elaborate on these findings here. Instead, an examination of similar findings is presented.

Currently, only two studies have investigated the relationship between level of Facebook use and Facebook Addiction (see Table 4.4). Koc and Gulyagci (2013) reported a significant positive correlation between weekly time commitment on Facebook and Facebook Addiction, while Hong et al. (2014) found that time spent using Facebook apps (including games), news feeds, and chat was significantly and positively correlated with Facebook withdrawal, tolerance, and life problems. Therefore, there is compelling evidence to suggest that excessive Facebook use is associated with Facebook Addiction. As even moderate daily use was predictive of Facebook Addiction (see Table 10.10), it may be the case that individuals spending more than two hours a day on Facebook are at risk.

10.3.2.4. Level of concern. As shown in Table 10.9, the presence of concern over Facebook use was one of the strongest predictors of Facebook Addiction. This indicates that Facebook addicts may be aware that their usage is out of control, excessive, or causing negative impacts in their life. Similar findings of self-recognition have also been reported among other types of addicts, such as misusers of alcohol
(Williams et al., 2006), for example. This is a promising sign, as it suggests that denial may not be a symptom of Facebook Addiction. If this is the case, it is likely that Facebook Addiction would respond to clinical intervention. On the other hand, it is possible that the inclusion of a variable measuring self-acknowledged problematic use may have skewed the results somewhat. Further research should therefore examine the role of denial in Facebook Addiction.

10.3.2.5. Socially motivated use. On a final note, the exclusion of the predictor related to socially motivated Facebook use from the final model was somewhat surprising, given the importance of preference for online social interaction to the social skill model of Generalised Problematic Internet Use (Caplan, 2010). In light of the results discussed here, particularly those seen in the cluster analysis (Section 10.3.1), it may be the case that the question designed to measure social motivation of Facebook use was worded too broadly. However, from the results shown in this thesis, it seems that most Facebook users, regardless of addiction, are motivated to use Facebook for social reasons. Further research should look specifically at whether social motivations differ among different types of Facebook addicts.

10.4. Summary

The aim of this chapter was to answer RQs 4 and 5 using quantitative analyses. The first step towards achieving this aim was to perform transformation of the qualitative data in order to ascertain which participants were potentially addicted to Facebook. At that point, a preliminary measure of Facebook Addiction was created. Using a cut-off point of 4, a sample of 59 potential Facebook addicts was identified and involved in further statistical analysis.

Cluster analysis was performed to answer RQ4. This resulted in the identification of three potential types of Facebook addicts: those heavily engaged in social activities and browsing, those who are shallowly engaged in social activities but heavily engaged in browsing, and those who are shallowly engaged both in social activities and browsing, but moderately engaged in gaming. Descriptive and qualitative data were explored for each of these clusters to gain further insights into these potentially heterogeneous types of Facebook addicts.

To answer RQ5, regression modelling was used. The resulting model successfully predicted 86% of potential Facebook addicts, and included the predictors age, sex, level of Facebook use, and level of Facebook concern. The inclusion of these predictors makes sense, in light of previous findings. It also
suggests that clinical intervention may be a possibility with Facebook addicts.

Finally, it is crucial to report that this exploratory study merely begins to paint a picture of the potential symptoms, types, pathways, and predictors of Facebook Addiction, and extensive additional research is required. Further directions for researchers will be discussed in Chapter 11, along with an examination of the limitations of Phase 3. In addition, Chapter 11 provides an integrated discussion relating to the results and findings of all three phases of this thesis.
Chapter 11
General Discussion and Conclusion

The aims of this final chapter are to examine how successful this thesis was in answering the five main research questions, and to explore the potential implications that the findings might have. Below, a summary of the three phases of research is presented, including a discussion of the main findings. In order to tie the findings of this thesis back to a theoretical framework, an analysis of the theoretical implications of these findings is also provided. Following this, the discussion turns to the implications of this thesis, and recommendations for future research. Limitations and concluding remarks are then provided.

11.1. Thesis Summary

As outlined in Chapter 1, the aim of this thesis was perform an in depth exploration of Facebook Addiction. This thesis was guided by research into Internet Addiction, but due to conceptual issues with that condition, it was not entirely restricted by it. Instead, a combination of exploratory and confirmatory techniques were used, and a three-phase research design was implemented. This design was based on the five initial research questions (first introduced in Chapter 1). The design and main findings of this thesis will now be summarised.

11.1.1. Phase 1. The first phase of research was designed to answer RQ1, which asked whether there is a common set of Internet Addiction symptoms. This question was answered by conducting a qualitative systematic review of valid, reliable, and popular Internet Addiction measures. The purpose of this review was to identify the factors within each measure (see Chapter 6). These factors were then thematically analysed to discover a common set of Internet Addiction symptoms.

The systematic review identified 30 measures of Internet Addiction (see Table 6.1). However, only six measures met the inclusion criteria (adequate psychometric properties and a high level of academic presence) and were included in the thematic analysis (see Table 6.3). It was noted in Chapter 7 that the processes surrounding item development for many measures of Internet Addiction are not broad enough to ensure that construct validity has been reached. As such, it was argued that more rigorous item development procedures should be implemented in the field of Internet Addiction research.
After conducting the thematic analysis of the six Internet Addiction measures, seven core themes were identified: negative consequences, loss of control, online social enhancement, preoccupation, mood alteration, withdrawal, and excessive use. These themes were proposed as the core symptoms of Internet Addiction. However, the thematic analysis also identified three other potential symptoms: reality substitution, distraction, and tolerance. While there was not enough support for these themes to be included among the core symptoms, further research should establish the relevance of these potential symptoms to online forms of addiction. In particular, it seems that distraction may be relevant to Facebook Addiction (this will be discussed further in Section 11.2).

Having identified a core set of seven symptoms, the argument was made that most popular instruments of Internet Addiction fail to include sufficient items to measure these components, particularly online social enhancement. In fact, the systematic review only identified one instrument that measures all seven symptoms: Caplan's (2002) GPIUS. Therefore, this instrument may be the best choice for researchers tasked with measuring Internet Addiction. It is worth noting that the items in this particular instrument were developed using research from multiple sources, which indicates that this measure may have construct validity.

11.1.2. Phase 2. The second research phase involved a qualitative study of Facebook Addiction (see Chapter 7). This study was designed to answer three research questions: whether the core Internet Addiction symptoms could be used to identify Facebook Addiction (RQ2), whether there are any unique symptoms or indicators of Facebook Addiction (RQ3), and whether Facebook Addiction takes different forms (RQ4). Participants were recruited using Facebook Ads, and qualitative data was collected using an online asynchronous focus group. By employing this design, it was possible to determine whether Facebook Addiction involved the same symptoms as Internet Addiction, as well as exploring whether there were any unique symptoms of Facebook Addiction. However, while 34 participants registered for the study, only three completed the focus group. Therefore, interpretation and discussion of these results was limited.

It was argued that the use of online asynchronous focus groups is challenging, and may be more appropriately utilised as a supplement for other forms of qualitative data collection. However, despite the methodological issues, responses from the three focus group respondents did appear to provide initial evidence for all of the seven core symptoms of Internet Addiction. Furthermore, three potentially unique
symptoms came to light: social obligation, mood maintenance, and disconnection. Due to the limitations associated with Phase 2, a larger sample was needed to confirm the relevance of these potentially unique themes.

11.1.3. Phase 3. Phase 3 was initially designed as a quantitative study, which aimed to discover whether individual, behavioural, or attitudinal characteristics could predict Facebook Addiction (RQ5). However, due to the limited dataset collected in Phase 2, it was necessary to redesign Phase 3 in order to answer RQs 2 to 5 (see Chapters 8, 9, and 10). The small sample size in Phase 2 was tied to two aspects of the design: reliance on only one method of recruitment, and a high level of commitment for study participants. As such, recruitment methods were broadened and an online survey was used to collect both quantitative (closed-ended) and qualitative (open-ended) data. An online focus group was also used to supplement survey results.

Phase 3 participants were 417 survey respondents and nine focus group respondents. Thematic analysis of the qualitative responses again provided support for all seven of the proposed core symptoms of Internet Addiction (see Section 9.2). In addition, evidence suggested that some addicts use Facebook because of boredom, while others experience fear of missing out or disconnection when Facebook use is ceased. There was also further support that Facebook users feel socially obligated to continue Facebook use, and update their status to maintain positive moods. However, the relationship between these behaviours and Facebook Addiction was unclear, and needs further validation.

In regards to the quantitative data analyses, data transformation (from qualitative to quantitative) was used to create a preliminary measure of Facebook Addiction (see Section 10.1). This measure was based on five of the seven core symptoms of Internet Addiction (negative consequences, preoccupation, mood alteration, withdrawal, and excessive use), plus one extra variable measuring self-acknowledged problematic use. After the creation of this measure, 59 potential Facebook addicts were identified. At that point, inferential statistics (cluster analysis and regression modelling) were performed.

Cluster analysis was used to assess whether Facebook Addiction takes different forms (RQ4). The results revealed that there were three groups of potential Facebook addicts: (1) those with high levels of social engagement and high levels of browsing (HSE-HB), (2) those with low levels of social engagement and high engagement in browsing (LSE-HB), and (3) those with low levels of social
engagement, and moderate levels of gaming (LSE-MG).

Based on the descriptive statistics and analysis of the qualitative data from cluster members, the following assumptions were made. First, it was suggested that HSE-HB individuals have a strong desire to know what is happening on Facebook, and are motivated to partake in social interaction on the site because it affords them higher levels of control over their interactions when compared to offline communication. Second, LSE-HB individuals find that they become preoccupied with checking Facebook, particularly when feeling bored. They also find that Facebook distracts them from their daily activities. Third, LSE-MG individuals feel more confident communicating on Facebook than offline, and have larger amounts of free time available to them than members of the other clusters. LSE-MG members appeared to fit most closely to the profile of a Facebook addict, based on the seven core symptoms that were examined.

In order to determine whether there are certain predictors of Facebook Addiction (RQ5), logistic regression was used. Based on a series of steps provided by Hosmer et al. (2013) a parsimonious model was built which correctly predicted 86% of potential Facebook addicts. This model included four predictors: age, sex, level of Facebook use, and level of concern about Facebook use. More specifically, it was apparent that being young, female, using Facebook heavily, and having at least some concern over Facebook use were predictive of Facebook Addiction.

Overall, the results of this thesis provided answers to the main research questions. While this disorder does fit within the broader framework of Internet Addiction symptoms, there may be more to understanding Facebook Addiction than just seven core symptoms. This was particularly apparent in the discussion relating to the proposed unique symptoms and indicators, as well as the three clusters of potential Facebook Addiction. In addition, Facebook Addiction does seem to take different forms, and these are related to the types of activities that are performed. Finally, it may be possible to predict Facebook Addiction using a combination of demographic, behavioural, and attitudinal variables.

11.2. Theoretical Implications

In Chapter 3, two theories of Internet Addiction were introduced: Davis' (2001) cognitive behavioural model, and Caplan's social skill model (2010). These models can be considered complementary, as they are both based on the premise that Internet Addiction occurs in individuals who feel more confident interacting online
than they do offline. However, while Davis' model focuses more on the pathways that lead to Internet Addiction, Caplan looks only at the symptoms associated with the disorder. In this section, these two aspects will be brought together to form a picture of the possible precedents and manifestation of Facebook Addiction.

In the context of the results provided in this thesis, there is preliminary support for both Davis' (2001) and Caplan's models (2010). In Davis' model, the pathways to Internet Addiction involve maladaptive cognitions about offline social interactions, offline social isolation, lack of offline social support, and seeking distraction. Within the data collected in this thesis, there was preliminary support for all of these aspects of Davis' model. For instance, even though there was no direct question regarding maladaptive cognitions, some participants noted that they were shy in offline interactions, but felt more confident communicating on Facebook. These kinds of responses were discussed in Sections 9.2.6.1 and 9.2.6.2. In regards to offline social isolation and lack of offline social support, it became clear that some individuals enjoyed using Facebook because it provided them with social interaction that they were lacking in their offline lives. As was discussed in Sections 7.3.3.2 and 9.2.6, this may be due to geographical isolation, or because of life circumstances (i.e., being a stay at home parent). Finally, evidence of seeking distraction was shown in Section 9.2.1, as many participants mentioned using Facebook to procrastinate from work, study, or chores.

In regards to Caplan's (2010) model, qualitative evidence also indicated that some Facebook users had a preference for online social interaction. These comments aligned with those discussed above relating to Davis' notion of maladaptive cognitions. Furthermore, as shown in Sections 7.3.3.4 and 9.2.5, some Facebook users clearly used Facebook to feel less lonely or dysphoric (mood alteration). There was also evidence that individuals developed deficient self-regulation of Facebook use (i.e., loss of control, excessive use), and this was shown in Sections 7.3.3.6, 9.2.3, and 9.2.7. Finally, there were a large number of responses indicating that negative consequences were a common outcome of this behaviour (see Sections 7.3.3.1 and 9.2.1).

While it seems that the results of this thesis support multiple components of Davis' (2001) and Caplan's (2010) models in isolation, it is important to ascertain how these components relate to each other. For example, in Caplan's social skill model, preference for online social interaction leads to use of the Internet for mood regulation. This behaviour then causes deficient self-regulation of Internet use, which
results in negative outcomes. While some of the qualitative data collected in Phase 2 and 3 may have shown that these kinds of relationships between symptoms did exist, the connection was not explicitly tested. However, while the thesis was (in part) based on inductive reasoning (see Chapter 5), several speculative pathways to Facebook Addiction are proposed below.

11.2.1. Proposed pathways to Facebook Addiction. Through consideration of the potentially unique symptoms of Facebook Addiction discussed in Sections 7.3.3.7 and 9.3, and the results of the cluster analysis (see Section 10.3.1) it seems that Facebook Addiction may develop in different ways. Therefore, four potential pathways to Facebook Addiction are proposed in Figure 11.1: online social enhancement, social monitoring, procrastination, and entertainment. These pathways are all preliminarily supported by the results discussed in this thesis, but more extensive research is needed to confirm their relevance to Facebook Addiction (and other forms of online addiction).

In Section 4.4.4.1, it was argued that there are three particular motivations associated with Facebook Addiction (social interaction, entertainment, and passing time), and the pathways suggested here support that claim. It is suggested that these motivations lead to different outcomes of Facebook use, and result in different withdrawal symptoms. However, despite these differences, all of the proposed pathways are linked to the outcome expectancy of mood alteration, that is, to escape from undesirable mood states. Once mood alteration occurs, the additional symptoms of addiction may follow. In this way, all of the proposed pathways support Caplan’s (2010) social skill model. However, in that model, preference for online social interaction is the main cause of addiction. In this thesis, several other potential alternatives were discussed, and these will be outlined below.

While it is possible that there are more than four pathways to Facebook Addiction, the results provided in this thesis suggest that those illustrated in Figure 11.1 are the most prevalent. Researchers could explore these potential pathways further using phenomenological methods (i.e. interviews). To do this, researchers should be aiming to tease out the motivations behind Facebook use, the personal outcomes of Facebook use, and the feelings that occur when Facebook is not available. It is also worth noting that Facebook Addiction may potentially occur due to a combination of pathways. This is illustrated below in Figure 11.2, using the cluster analysis results as examples. This notion will be expanded upon in the sections below.
Figure 11.1. Four potential pathways to Facebook Addiction.
11.2.1.1. **Online social enhancement.** In this proposed pathway, individuals use Facebook because they are unhappy with their offline social lives. This experience may be due to a lack of social confidence (see Sections 9.2.6.1 and 9.2.6.2) or it may be due to social isolation (see Section 9.2.6.3). Regardless of the reasons for their discontent, these individuals find that Facebook provides them with a level of social interaction that is lacking in their offline lives (online social enhancement). As a result, they enjoy engaging in social interaction on Facebook by using applications such as chat, messages, and comments.

For individuals who are lonely, the behaviour of seeking online social enhancement through Facebook use may eventually become reinforced through the outcome expectancy of social contact or support. Once this occurs, individuals may become preoccupied with Facebook, and lose control over their use. This then leads to excessive use and negative consequences. In situations where these individuals are not able to access Facebook, they may revert to their previous feelings of
loneliness and experience withdrawal symptoms (i.e., disconnection; see Section 9.3.4). As indicated above, preliminary support for the existence of this pathway was provided throughout Chapter 9. In addition, the responses of the three focus group respondents in Phase 2 (see Chapter 7) were suggestive of this form of addiction: Participant 1 used Facebook due to social anxiety, Participant 2 was motivated to use Facebook due to being a stay-at-home mother, and Participant 3 used Facebook due to isolation from her friends and family. Support was also found in the cluster analysis results: members of the HSE-HB cluster and the LSE-MG cluster both indicated that they felt more comfortable communicating on Facebook than in offline situations.

Out of all of the pathways to Facebook Addiction depicted in Figure 11.1, the online social enhancement pathway aligns most closely with Davis’ (2001) and Caplan’s (2010) models of Internet Addiction (see Section 3.4). It is also supported by empirical research. For example, research has indicated that lonely people use Facebook to connect with others (Clayton, Osborne, Miller, & Oberle, 2013), socially anxious people perceive increases in social support and well-being from Facebook use (Indian & Grieve, 2014), and individuals with a preference for online social interaction can become addicted to Facebook (Lee et al., 2012). Of course, it is important to reiterate that not all of the individuals who become addicted in this way have a preference for online social interaction. In fact, some may state that they prefer to communicate face-to-face but, due to their life circumstances or geographical location, this is not often possible. Further research is therefore needed to examine the proposed relationship between social isolation and the development of Facebook Addiction.

It is also important to note that the models devised by Davis (2001) and Caplan (2010) encompass various forms of online social activity. Therefore, it is likely that this potential pathway to addiction is not exclusive to Facebook use. In fact, Wan (2009) reported that loneliness was a significant predictor of addiction to the campus-based SNS xiaonet.com, while Hong & Wang (2012) found that loneliness was associated with mobile phone addiction. Therefore, further research is recommended to assess whether pathway might relate to various forms of online addiction.

11.2.1.2. Social monitoring. In this potential pathway to addiction, individuals use Facebook because it allows them to monitor the activity of their friends, thus providing a sense of connectedness and social inclusion. As such, their Facebook activities revolve around checking the News Feed for new updates. Loss of control of
Facebook use occurs in individuals who feel a fear of missing out (FOMO; see Section 9.3.3) when they fail to monitor the site. For those individuals, the repetitive behaviour of checking Facebook for new updates relieves that negative feeling, and an outcome expectancy of mood alteration is reinforced. It is possible that this reinforcement occurs on a variable-schedule ratio, as new content is posted on the News Feed at random intervals (see Section 9.2.2.1).

It is likely that individuals on this pathway to addiction experience interference with work and study, as they are often distracted from these activities by checking Facebook (Przybylski et al., 2013). They may also feel frustrated when no new content has been posted to Facebook since the last time they checked. Both of these themes were present in the survey and focus group data reported in Chapter 9. In addition, members of the HSE-HB and LSE-HB clusters of Facebook addicts (see Section 10.3.1) both showed a strong need to keep abreast of new information by regularly checking Facebook. Therefore, members of these clusters potentially included individuals who became addicted to Facebook via the social monitoring pathway (see Figure 11.2).

References to a social monitoring pathway to addiction have not been common in the academic literature. However, in one qualitative study of Facebook addicts, a female participant admitted that limiting her Facebook checking to once a day left her feeling overwhelmed with information (Zaremohzzabieh et al., 2014). As a result, she spent most of her time checking Facebook for updates in order to more efficiently monitor what was happening with her friends. In addition, Przybylski et al. (2013) reported that individuals who experienced FOMO were more likely to use Facebook after waking, before sleep, and during meals and lectures.

While Facebook is not the only form of SNS to provide a feature offering a real-time, continuously updating stream of information (i.e., Twitter, LinkedIn), it does have the largest membership base. Therefore, it is probable that members of an individual’s offline social network would be more heavily represented on Facebook than other SNSs. As such, addiction developed via the social monitoring pathway may be specific to Facebook. Researchers should attempt to confirm that this is the case by directly examining the relationship between Facebook Addiction and FOMO. In addition, it is worth examining how the thoughts related to FOMO develop. For example, they may be more common among individuals with certain personality traits (i.e., neurotic, extraverted), or they may occur in response to a particular life event involving Facebook (i.e., an instance of social exclusion).
11.2.1.3. Procrastination. In this potential pathway, individuals are motivated to use Facebook to avoid completing mundane or difficult tasks. Like the previously discussed pathways, this pattern of behaviour is expected to lead to mood alteration in at-risk individuals, through the alleviation of stress or the fear of starting a new task. As this pathway is not intrinsically linked to a need for social interaction or monitoring, it is likely that this type of addiction would be associated with broad Facebook usage (i.e., engaging in a range of activities on Facebook).

According to Davis (2001), individuals who develop Generalised Problematic Internet Use are highly likely to use the Internet to procrastinate from other tasks. As such, the Online Cognitions Scale (Davis et al., 2002) includes a factor that measures task avoidance (distraction; see Table 6.3). In Phase 3, there were a large number of participants who admitted that they used Facebook to procrastinate from other important tasks. For instance, several women indicated that they spent so much time using Facebook that they were failing to complete housework or cook dinner on time. In some cases, the husbands of these women had told them that they were using Facebook problematically, but their excessive use continued. Some also indicated that they knew they should stop using Facebook in this way, but that they had experienced a loss of control over their usage. The theme of procrastination also came up in the response of LSE-MG cluster members (10.3.1.3).

According to the Big Five theory of personality (Goldberg, 1990), procrastination from activities is generally linked to low levels of the trait conscientiousness. It is worth noting that numerous studies have reported that there is an association between low levels of conscientiousness and addiction (i.e., Buckner, Castille, Sheets, 2012; Kotov, Gamez, Schmidt, & Watson, 2010; Yang, Li, & Mingxin, 2006). In particular, Wilson, Fornasier, and White (2010) reported that individuals with low conscientiousness had higher levels of both SNS use and addictive tendencies. In addition, Ryan and Xenos (2011) found that Facebook users were more likely than non-users to be low on conscientiousness. Therefore, it may be the case that low conscientiousness is linked with the development of Facebook Addiction through the procrastination pathway.

It seems then that there is a solid basis for further exploration of this potential pathway. However, it is important to ascertain whether individuals who fit this pattern of addiction are only addicted to Facebook, or to other Internet-related activities as well. Given that distraction was identified as a potential symptom of Internet Addiction by Davis et al. (2002), it is likely that task avoiders become addicted to a variety of
online applications. However, if there is a subset of addicts whose addiction is focused solely on Facebook, it is important to determine what it is about the site that is appealing to those particular individuals.

11.2.1.4. Entertainment. In the final potential pathway illustrated in Figure 11.1, individuals who have excessive free time elect to use Facebook as a method of entertainment. For example, several of the LSE-MG cluster members mentioned having nothing else to do other than use Facebook. Such individuals may potentially be unemployed, stay-at-home parents, or retired. Addiction occurs when these individuals begin to rely on Facebook as tool for a method of escaping from boredom, thus experiencing mood alteration. As with the procrastination pathway, it is likely that this type of addiction would be associated with broad Facebook usage. Furthermore, due to the excess free time that these individuals have, their Facebook use may become very heavy. As previously outlined (see Section 9.3.2) researchers have linked boredom to addiction to online gaming. Therefore, this potential pathway to Facebook Addiction should be explored further, particularly in relation to loss of control over Facebook games.

11.3. Implications and Future Research

One of the cornerstones of this thesis was the argument that, in order to be taken seriously, online addiction researchers should attempt to develop the construct validity of these disorders. As such, this thesis used an exploratory methodology to investigate the potential symptoms of Facebook Addiction. While Internet Addiction symptoms were used as a basis for exploration, it became clear that there are limitations associated with the most popular measures of this disorder. It is therefore argued that online addiction researchers should develop a systematic method of item development that relies on multiple sources of information (i.e., theory, qualitative data, previous research). Failure to take this approach can reduce the construct validity of the condition under investigation and result in conceptual confusion.

Through the proposal of four potential pathways to Facebook Addiction, this thesis sets a strong course for more exploratory research. At this point, it is recommended that researchers conduct more phenomenological studies, particularly employing interview techniques. The collection of more focused qualitative data, specifically from self-acknowledged addicts, will add to the theoretical underpinnings and construct validity of this condition. It will also help determine the unique components of this disorder. Once these elements have been determined, it will be
possible to construct a reliable and valid measure of Facebook Addiction, with which quantitative data can be collected.

As outlined in Section 11.2, it is likely that different people are at-risk of become addicted to Facebook in different ways. While most of these different types of addiction do not seem to be specifically associated with Facebook in particular, the social monitoring pathway may be. However, it is important to note that while the pathways outlined above are all based on findings from this thesis, they require more extensive research to find support. By the same token, it is likely that the identification of potential Facebook addicts that occurred in Chapter 10 was limited by the fact that it was only based on five core symptoms of Internet Addiction. As such, it failed to take into account individuals who were experiencing loss of control, online social enhancement, or other unique symptoms of Facebook Addiction. This is yet another reason why further exploratory research is necessary.

Based on the four proposed pathways to Facebook Addiction, it seems plausible that the development of addiction is tied to certain motivations of Facebook use. However, it is unlikely that most people who use Facebook in these ways will become addicted to using the site. In fact, it is expected that particular forms of underlying psychopathology are the key to the development of each type of Facebook Addiction. For example, social anxiety might be one sufficient cause of Facebook Addiction, as it occurs through the online social enhancement pathway. Therefore, it is important for future research to ascertain which mental disorders display comorbidity with Facebook Addiction. In addition, the temporal nature of this disorder needs to be explored; is Facebook Addiction a short-term condition that disappears without treatment, or is it highly pervasive? Clearly, construct validity needs to be achieved before such questions can be answered.

11.4. Limitations

Perhaps one of the more substantial limitations associated with this thesis was the broadness of the questions used to collect qualitative data. This was considered to be a necessity, given that this was an exploratory study designed to avoid relying entirely on preconceived structures of addiction. For example, RQ3 asked whether there were any unique symptoms or indicators of Facebook Addiction, and this question could not be answered using narrowly worded questions based on existing symptoms of addiction. However, the consequence of this approach was that, while a large amount of qualitative data was collected, most of the resulting themes were not
relevant to Facebook Addiction. These themes were therefore deemed to be outside the scope of this thesis, and were not examined further. In addition, some of the themes that were of interest (i.e., loss of control, mood alteration) were not as strongly supported as they might have been with more direct questioning. In order to avoid this, it may have been possible to word the questions more narrowly in future research. It is strongly recommend that further research should add to the results provided here by including more direct questions relating to loss of control and mood alteration.

In addition, taking another approach to data collection may have resulted in more specific data related to Facebook Addiction. For example, the majority of the qualitative data was collected using an online survey, which failed to allow interaction to occur between the researcher and the participants. Due to this, participants sometimes provided responses that were ambiguous, and could not be adequately analysed. While the online focus group was used to supplement the survey data, only limited data was collected using this method (the limitations of this form of data collection were discussed in Section 7.4). In future, researchers would benefit from conducting qualitative interviews with participants who perceive themselves to have a problem with Facebook use.

Finally, it is important to reiterate that this study was exploratory. Therefore, the results and findings provided within this thesis do not provide concrete answers about the development or prevalence of Facebook addiction. In addition, the measure of Facebook Addiction developed in this study is only preliminary, and further exploration of the relevant symptoms is necessary before a valid scale can be constructed. Most importantly, further research is needed to validate the pathways to addiction provided in this chapter. At this point, considerably more research is needed in order to move towards construct validity of Facebook Addiction. However, the results and findings discussed in this thesis provide a basis for the argument that Facebook Addiction does exist.

11.5 Conclusion

From the results provided in this thesis, there is compelling evidence that some people do develop disordered use of Facebook. For example, there was sufficient evidence to confirm that some individuals use Facebook to escape from negative moods, experience preoccupation with Facebook, lose control over their Facebook use, use Facebook excessively, and feel withdrawal when not using
Facebook. However, more research is needed to confirm that individuals experience severe negative consequences due to their addictive behaviour. In addition, while there were a number of participants who admitted feeling some form of withdrawal when they stopped using Facebook, many mentioned that these unpleasant feelings subsided quickly. As a result, the severity of this condition needs further confirmation. Nevertheless, many participants recognised that their Facebook use was intrusive, excessive, out of control, or addictive. Clearly, Facebook Addiction is a disorder worth further examination.

While it is clear that Facebook use is still increasing in prevalence, it is possible that enthusiasm for this SNS will eventually decline; the same trend was apparent in use of other SNSs (i.e., Friendster, MySpace). However, as illustrated in this chapter, much of the content in this thesis may also be useful for researchers interested in other forms of online addiction. In particular, the link between boredom and social network based gaming deserves further attention. Likewise, it is possible that the desire for online social enhancement is linked to various forms of online social activities (i.e., instant messenger, voice over Internet protocol services, other SNSs). As such, this thesis clearly has relevance for many aspects in the domain of online addiction research.
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Appendices

Appendix A: DSM-IV Criteria for Substance Dependence

(3 or more in a 12-month period)

A. Tolerance (marked increase in amount; marked decrease in effect)
B. Characteristic withdrawal symptoms; substance taken to relieve withdrawal
C. Substance taken in larger amount and for longer period than intended
D. Persistent desire or repeated unsuccessful attempts to quit
E. Much time/activity to obtain, use, recover
F. Important social, occupational, or recreational activities given up or reduced
G. Use continues despite knowledge of adverse consequences (e.g., failure to fulfill role obligation, use when physically hazardous)

Appendix B: DSM-IV Criteria for Substance Withdrawal

A. The development of a substance-specific syndrome due to the cessation of (or reduction in) substance use that has been heavy and prolonged.

B. The substance-specific syndrome causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

C. The symptoms are not due to a general medical condition and are not better accounted for by another mental disorder.

Appendix C: DSM-IV Criteria for Pathological Gambling

A. Persistent and recurrent maladaptive gambling behavior as indicated by at least five of the following:

1. is preoccupied with gambling (e.g., preoccupied with reliving past gambling experiences, handicapping or planning the next venture, or thinking of ways to get money with which to gamble)
2. needs to gamble with increasing amounts of money in order to achieve the desired excitement
3. has repeated unsuccessful efforts to control, cut back, or stop gambling
4. is restless or irritable when attempting to cut down or stop gambling
5. gambles as a way of escaping from problems or of relieving a dysphoric mood (e.g., feelings of helplessness, guilt, anxiety, depression.
6. after losing money gambling, often returns another day in order to get even (“chasing” one’s losses)
7. lies to family members, therapist, or others to conceal the extent of involvement with gambling
8. has committed illegal acts, such as forgery, fraud, theft, or embezzlement, in order to finance gambling
9. has jeopardized or lost a significant relationship, job, or educational or career opportunity because of gambling
10. relies on others to provide money to relieve a desperate financial situation caused by gambling

B. The gambling behavior is not better accounted for by a Manic Episode.

Appendix D: DSM-IV Criteria for Obsessive Compulsive Disorder

A. The person exhibits either obsessions or compulsions

1. Obsessions are indicated by the following:
   a. recurrent and persistent thoughts, impulses, or images that are experienced, at some time during the disturbance, as intrusive and inappropriate and that cause marked anxiety or distress.
   b. the thoughts, impulses, or images are not simply excessive worries about real-life problems.
   c. the person attempts to ignore or suppress such thoughts, impulses, or images, or to neutralize them with some other thought or action.
   d. the person recognizes that the obsessional thoughts, impulses, or images are a product of his or her own mind (not imposed from without as in thought insertion).

2. Compulsions are indicated by the following:
   a. repetitive behaviours (e.g., hand washing, ordering, checking) or mental acts (e.g., praying, counting, repeating words silently) that the person feels driven to perform in response to an obsession, or according to rules that must be applied rigidly
   b. the behaviours or mental acts are aimed at preventing or reducing distress or preventing some dreaded event or situation; however, these behaviours or mental acts either are not connected in a realistic way with what they are designed to neutralize or prevent or are clearly excessive.

B. At some point during the course of the disorder, the person has recognised that the obsessions or compulsions are excessive or unreasonable

C. The obsessions or compulsions cause marked distress, are time consuming (take more than 1 hour a day), or significantly interfere with the person's normal routine, occupational/academic functioning, or usual social activities or relationships
D. If another Axis I disorder is present, the content of the obsessions or compulsions is not restricted to it (e.g., preoccupation with drugs in the presence of a substance abuse disorder)

E. The disturbance is not due to the direct physiological effects of a substance (e.g., drug abuse, a medication) or a general medical condition

Appendix E: DSM-IV Criteria for Substance Abuse

(1 or more in a 12-month period)

Symptoms must never have met criteria for substance dependence for this class of substance.

A. Recurrent use resulting in failure to fulfill major role obligation at work, home or school

B. Recurrent use in physically hazardous situations

C. Recurrent substance related legal problems

D. Continued use despite persistent or recurrent social or interpersonal problems caused or exacerbated by substance

Thank you for your interest in this research project!

If you choose to participate, you will be required to fill out a short online survey and take part in an online focus group. Both the survey and the focus group will be completely anonymous and can be completed in your own time.

Please click the 'Next' button below to read the Project Information Statement.
Dear Facebook user,

You are invited to participate in a research project being conducted by RMIT University in Melbourne, Australia. This information page describes the project in straightforward language, or 'plain English'. Please read this document carefully and be confident that you understand its contents before deciding whether to participate. If you have any questions about the project, please contact the primary investigator Traci Ryan at traci.ryan@rmit.edu.au, or the senior project supervisor Associate Professor Andrea Chester on +61 3 9925 3150 or andrea.chester@rmit.edu.au

Who is involved in this research project? Why is it being conducted?

Traci Ryan is undertaking this research project as a partial requirement for the degree of Doctor of Philosophy (Psychology). The project is being supervised by Associate Professor Andrea Chester and Dr Sophia Xenos from the Discipline of Psychology at RMIT University in Melbourne, Australia. The RMIT Human Research Ethics Committee has given their approval for this project.

Why have you been recruited?

We are inviting Facebook users who have concerns about their Facebook usage to take part in this research project. In order to be included in this project you must meet the following criteria:

- Current Facebook user
- Proficient in written English
- Over the age of 18
- Resident of Australia, New Zealand, the UK, Canada, or the USA.

What is the project about? What are the questions being addressed?

This project seeks to confirm the existence and impact of problematic Facebook use. Problematic Facebook use can be defined as Facebook use that is excessive, intrusive, or causes problems in an individual’s life.

The general research questions being addressed in this project are:

- Does problematic Facebook use exist?
- Are there different types of problematic Facebook use?
- What are the psychological and social impacts of problematic Facebook use?
- Is problematic Facebook use similar or different to problematic Internet use?
- What types of people tend to develop problematic Facebook use?

If I agree to participate, what will I be required to do?

You will first be asked to complete a short screening questionnaire. The questionnaire will ask for some information regarding your demographics, and what area of your Facebook use concerns you the most. This survey contains 8 questions, and should take less than 5 minutes to complete.

You will then be invited to take part in an online focus group. This focus group will be held on a secure online discussion forum. For the most part, this focus group will be structured like a typical online discussion forum. Each of the main focus group questions will be asked in a separate discussion thread, and you will be encouraged to contribute answers to each question. You will also be encouraged to read other the responses of other focus group members, and engage in discussions as a group. Within each discussion thread, the moderator may also ask additional questions designed to generate further discussion on a particular topic.

The focus group has been designed so that you can take part in your own time. Your level of contribution to the discussion is up to you, but you will be encouraged to answer each of the five questions, as well as participating in discussions with other focus group members. As a result, your overall time commitment will depend on how much you wish to engage with the focus group process. However, it is not expected that you should exceed more than an hour per question (or five hours in total). To keep the focus group running effectively, it is recommended that you respond to all questions and discussions within 24 hours of registering.

If you decide to take part in this research project, you will need to create a forum username. In order to protect your anonymity, this username should be a pseudonym that does not contain any identifying information, and that you have not used on the Internet before. You will also be required to provide an email address when registering for the online discussion forum. Please be aware that this is an RMIT IT requirement, and neither the researchers nor other participants will have access to this information.

Your participation in this research project is completely voluntary. If you decide to participate, you will be required to provide your consent at the bottom of this page. You are free to withdraw your consent at any time throughout the project, and to request that any data you have provided be withdrawn, provided that it can be identified and hasn't already been published.
What are the risks or disadvantages associated with participation?

Physical or emotional risks

For the most part, there are not expected to be major risks or disadvantages associated with participation in this research project. However, the focus group questions do necessitate that you reflect on the fact that your Facebook usage may be problematic, and may be causing negative consequences in your life. The researchers understand that such questions are of a sensitive nature, and may lead to emotional distress for some individuals. This risk may be heightened for people who suffer from emotional impairments, mental illnesses, or psychological disorders. Because of these risks, it is recommended that you carefully consider whether participation in this research project may lead you to experience unnecessary emotional distress. In order for you to make an informed decision, two sample focus group questions have been provided:

"Can you think of any instances when your Facebook use interfered with your normal daily activities or personal relationships?"

"Explain how you’re usually feeling when you get the urge to use Facebook."

A list of mental health resources and crisis hotlines will be available on the forum at all times. In order to minimise risk to all participants, the forum moderator will be monitoring all responses. If you do appear to be experiencing emotional distress, you will be contacted by the moderator via private message and provided with a list of relevant resources. You are also advised to contact the researchers if your participation is causing you any form of distress. Depending on your level of distress, it may be necessary for you to withdraw from the study.

Security of the website

Users should be aware that the World Wide Web is an insecure public network that gives rise to the potential risk that a user’s transactions are being viewed, intercepted or modified by third parties or that data which the user downloads may contain computer viruses or other defects.

Security of the data

This project will use an external site to create, collect and analyse data collected in a survey format. The site we are using is Survey Monkey. If you agree to participate in this study, the responses you provide to the survey will be stored on a host server that is used by Survey Monkey. No personal information will be collected in the survey so none will be stored as data.

This project will also use an online forum hosted in the Amazon Web Services Cloud. The only personal information that will be collected during this project is your email address, and this will be accessible only to one member of the RMIT information technology staff. None of the researchers or other participants will have access to this information. At the conclusion of the data collection process, your email address will be deleted and expunged from the host server.

Once we have completed our data collection and analysis, we will import the data we collect, with the exception of your email address, to the RMIT server where it will be stored securely for a period of five (5) years. The data on the Survey Monkey and web hosting company servers will then be deleted and expunged.

What are the benefits associated with participation?

There are no direct benefits associated with participation in this project. However you will be contributing to an important research project, which could lead to the development of clinical interventions for problematic users of Facebook. Some participants may also appreciate the opportunity to reflect on their own use of Facebook.

What will happen to the information I provide?

At the conclusion of this project, the data you provide will be analysed by the researchers. Once data collection and analysis has been completed, all data will be stored on RMIT University’s servers for a period of at least five (5) years, after which time it will be destroyed.

Any information that you provide can be disclosed to a third party only if (1) it is to protect you or others from harm, (2) a court order is produced, or (3) you provide the researchers with written permission.

The results of this research project will be presented in a student thesis. It is also anticipated that results may be submitted for publication in a psychological journal, and presented as a conference paper. Published results may use your pseudonym, but no personally identifying information will be included, as none will be available to the researchers.

A report featuring the project results and outcomes will be made available to you at the conclusion of the research project. Interested participants will be invited to email Traci Ryan at the conclusion of the focus groups and register their interest in receiving this report.
What are my rights as a participant?

Participation in this research project allows you:

- The right to refuse to answer any question, at any time, without prejudice.
- The right to have any unprocessed data withdrawn and destroyed, provided it can be reliably identified, and provided that so doing does not increase the risk for the participant.
- The right to have any questions answered at any time.

Whom should I contact if I have any questions?

If you require further information, or have any concerns about your participation in this research project you should contact the senior project supervisor, Associate Professor Andrea Chester at your convenience. In the event that you are concerned about any of your responses to any of the focus group questions, you should contact the researchers using the details provided above, or speak to your local mental health professional.

What other issues should I be aware of before deciding whether to participate?

Please be aware that any posts you make on the forum will be viewable by other research participants.

In order to protect all participants from inappropriate content, the forum moderator will check all posts before they are published to the focus group forum.

At the conclusion of the focus group, participants will receive a $10 iTunes gift code as a reimbursement for the time spent participating in the research project.

Please indicate whether you consent to participate in this study and whether you meet the following criteria:

- I consent to participate in this study
- I am over 18 years of age
- I am a current Facebook user
- I am a resident of Australia, Canada, New Zealand, the United Kingdom, or the United States of America
- I have concerns about my use of Facebook
Please note: It is strongly recommended that you print this page for your records before moving on to the next page. You will not be able to return to this page once you have clicked 'Next'. To print, please go to your browser's 'File' menu and select 'Print'.

Thank you,

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Any complaints about your participation in this project may be directed to the Executive Officer, RMIT Human Research Ethics Committee, Research & Innovation, RMIT, GPO Box 2476V, Melbourne, Australia, 3001. If you wish to make a complaint about this project, please quote the project number 58/11.

Details of the complaints procedure are available at: http://www.rmit.edu.au/research/hrec_complaints/
Thank you for choosing to participate in this study!

Before taking part in the focus groups, you will need to answer the following survey questions.

How old are you?
- [ ] 17 or under
- [ ] 18 or over (please specify your actual age in the box)

What is your sex?
- [ ] Male
- [ ] Female

Which country do you live in?
- [ ] Australia
- [ ] Canada
- [ ] New Zealand
- [ ] United Kingdom
- [ ] United States of America
- [ ] Other (please specify)

Do you currently have a Facebook account?
- [ ] Yes
- [ ] No
How concerned are you about your Facebook usage?

☐ Not at all concerned
☐ Mildly concerned
☐ Moderately concerned
☐ Very concerned
☐ Extremely concerned

Can you briefly describe what concerns you about your Facebook usage? (i.e., I spend too much time playing Facebook Games, I use Facebook obsessively to check up on my partner)

On average, how much time per day do you spend on Facebook (for non-work related purposes)?

☐ 30 minutes or less
☐ 31-60 minutes
☐ 1-2 hours
☐ 2-4 hours
☐ 5-8 hours
☐ 9-12 hours
☐ More than 12 hours

How often do you use Facebook on devices other than your computer (for non-work related purposes)?

☐ Never
☐ Rarely
☐ Sometimes
☐ Often
Appendix G: Phase 3 Survey

Thank you for your interest in this research project!

If you choose to participate, you will be required to fill out an online survey. Depending on your answers, the survey should take between 5 and 20 minutes to complete.

Participants from selected countries will also be given the option to take part in an online focus group. Both the survey and the focus group will be completely anonymous and can be completed in your own time.

On the next page there is a statement outlining information about this project. Please click the 'Next' button below to read through this information. Once you are satisfied that you understand the project information, you will be asked to indicate whether you give your consent to participate in the project.

Please read the Project Information Statement and then click the 'Next' button if you wish to take part in the study. You may download a copy of the Project Information Statement for your records if you wish (recommended).

If you do not wish to take part, please close your browser tab to exit the survey.

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Problematic Facebook Use in an Adult Sample: A Confirmatory Study Using Qualitative Methods

Investigators:
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Dear Facebook user,

You are invited to participate in a research project being conducted by RMIT University in Melbourne, Australia. This information page describes the project in straightforward language, or 'plain English'. Please read this document carefully and be confident that you understand its contents before deciding whether to participate. If you have any questions about the project, please contact the primary investigator Tracii Ryan at tracii.ryan@student.rmit.edu.au, or the senior project supervisor Associate Professor Andrea Chester on +61-3-9925-3150 or andrea.chester@rmit.edu.au.

Who is involved in this research project? Why is it being conducted?

Tracii Ryan is undertaking this research project as a partial requirement for the degree of Doctor of Philosophy (Psychology). The project is being supervised by Associate Professor Andrea Chester.
Why have you been recruited?

We are inviting adult Facebook users to take part in this research project. In order to be included in this project you must meet the following criteria:

- Current Facebook user
- Proficient in written English
- Over the age of 18

What is the project about? What are the questions being addressed?

This project seeks to confirm and explore the existence and impact of problematic Facebook use. Problematic Facebook use can be defined as Facebook use that is excessive, intrusive, or causes problems in an individual’s life.

The general research questions being addressed in this project are:

1. Does problematic Facebook use exist?
2. Are there different types of problematic Facebook use?
3. What are the psychological and social impacts of problematic Facebook use?
4. Is problematic Facebook use similar or different to problematic Internet use?
5. What types of people tend to develop problematic Facebook use?
6. What sort of differences exist between people who use Facebook in problematic ways and people who don’t?

If I agree to participate, what will I be required to do?

You will be asked to complete an anonymous online survey. The survey will ask a number of demographic questions, as well as several questions regarding your personal Facebook usage. The survey includes a mix of multiple choice and short answer questions, and should take between 5 - 30 minutes to complete.

At the conclusion of the survey, residents of Australia, Canada, Ireland, New Zealand, The United Kingdom, and The United States of America will also be given the option to take part in an online focus group. The focus group will be held on a secure private online discussion forum. For the most part, this focus group will be structured like a typical online discussion forum. You will be encouraged to contribute your thoughts and feelings regarding your Facebook use, and discuss these with other members of the group. You may also read the responses of other focus group members, and make comments on their contributions. The primary investigator may also ask additional questions designed to generate further discussion on a particular topic, and you will also be encouraged to respond to these.

Your overall time commitment for the focus group aspect of the project will depend on how engaged you become with the discussion, however for most people participation is not expected to exceed one hour in total. The focus group has been designed so that you can take part in your own time, but in order to keep the discussion running efficiently it is recommended that you post within 24 hours of registering.

If you decide to take part in the focus group you will need to create a forum username. In order to protect your anonymity, this username should be a pseudonym that does not contain any identifying information, and that you have not used on the Internet before. You will also be required to provide an email address when registering for the online discussion forum. Please be aware that this is an RMIT IT requirement, and neither the investigators nor other participants will have access to this information.

Your participation in this research project is completely voluntary. If you decide to participate you will be required to provide your consent at the bottom of this page. You are free to withdraw your consent at any time throughout the project, and to request that any data you have provided be withdrawn, provided it can be identified and hasn’t already been published.

What are the risks or disadvantages associated with participation?

Physical or emotional risks
For the most part, there are not expected to be major physical or emotional risks or disadvantages associated with participation in this research project. However, the survey and focus group questions do necessitate that you reflect on the fact that your Facebook usage may be problematic, and may be causing negative consequences in your life. The investigators understand that such questions are of a sensitive nature, and may lead to emotional distress for some individuals. This risk may be heightened for people who suffer from emotional impairments, mental illnesses, or psychological disorders. Because of these risks, it is recommended that you carefully consider whether participation in this research project may lead you to experience unnecessary emotional distress. In order for you to make an informed decision, two sample survey questions have been provided:

“Can you think of any instances when your Facebook use interfered with your normal daily activities or personal relationships?”

“Have you ever been told by someone that you spend too much time using Facebook, or that you use Facebook in a problematic way?”

Several online self-help resources will be provided at the conclusion of the survey. A list of mental health resources and crisis hotlines will also be available for focus group participants on the discussion forum at all times. In order to minimise risk to all focus group participants, the primary investigator will be monitoring all responses. If you do appear to be experiencing emotional distress, you will be contacted by the primary investigator via private message and provided with a list of relevant resources. You are also advised to contact the investigators if your participation is causing you any form of distress. Depending on your level of distress, it may be necessary for you to withdraw from the study.

Security of the website

Users should be aware that the World Wide Web is an insecure public network that gives rise to the potential risk that a user’s transactions are being viewed, intercepted or modified by third parties or that data which the user downloads may contain computer viruses or other defects.

Security of the data

This project will use an external site to create, collect and analyse data collected in a survey format. The site we are using is Qualtrics. If you agree to participate in this study, the responses you provide to the survey will be stored on a host server that is used by Qualtrics. No personal information will be collected in the survey so none will be stored as data.

This project will also use an online forum hosted in the Amazon Computing Cloud. The only personal information that will be collected during this project is your email address, and this will only be accessible to one member of the RMIT information technology staff. None of the investigators or other participants will have access to this information. At the conclusion of the data collection process, your email address will be deleted and expunged from the host server.

Once we have completed our data collection and analysis, we will import the data we collect, with the exception of your email address, to the RMIT server where it will be stored securely for a period of five (5) years. The data on the Qualtrics and web-hosting company servers will then be deleted and expunged.

What will happen to the information I provide?

At the conclusion of this project, the data you provide will be analysed by the primary investigator. Once data collection and analysis has been completed, all data will be stored on RMITUniversity’s servers for a period of at least five (5) years, after which time it will be destroyed.

Any information that you provide can be disclosed to a third party only if (1) it is to protect you or others from harm, (2) a court order is produced, or (3) you provide the researchers with written permission.

The results of this research project will be presented in a student thesis. It is also anticipated that results may be submitted for publication in a psychological journal, and presented as a conference paper. Published results may use your pseudonym, but no personally identifying information will be included, as none will be available to the investigators.
A report featuring the project results and outcomes will be made available at the conclusion of the research project. Interested participants will be invited to email the primary investigator at the conclusion of the focus groups and register their interest in receiving this report.

**What are the benefits associated with participation?**

There are no direct benefits associated with participation in this project. However you will be contributing to an important research project, which could lead to the development of clinical interventions for problematic users of Facebook. Some participants may also appreciate the opportunity to reflect on their own use of Facebook.

**What are my rights as a participant?**

Participation in this research project allows you:

- The right to refuse to answer any question, at any time, without prejudice.
- The right to have any unprocessed data withdrawn and destroyed, provided it can be reliably identified, and provided that so doing does not increase the risk for the participant.
- The right to have any questions answered at any time.

**Whom should I contact if I have any questions?**

If you require further information, or have any concerns about your participation in this research project you should contact the senior project supervisor, Associate Professor Andrea Chester at your convenience. In the event that you are concerned about any of your responses to any of the focus group questions, you should contact the investigators using the details provided above, or speak to your local mental health professional.

**What other issues should I be aware of before deciding whether to participate?**

Please be aware that any posts you make on the forum will be viewable by other research participants.

In order to protect all participants from inappropriate content, the primary investigator will check all discussion forum posts before they are published to the focus group forum.

Thank you,

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Discipline of Psychology School of  
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Any complaints about your participation in this project may be directed to the Executive Officer, RMIT Human Research Ethics Committee, Research & Innovation, RMIT, GPO Box 2476V, Melbourne, Australia, 3001. If you wish to make a complaint about this project, please quote the project number 56/11.

Please indicate whether you consent to participate in this study and whether you meet the following criteria:

- [ ] I consent to participate in this study
- [ ] I am over 18 years of age
- [ ] I am a current Facebook user
- [ ] I am proficient in written English

What is your sex?

- [ ] Male
- [ ] Female

What country do you live in?

- [ ] Australia
- [ ] Canada
- [ ] Ireland
- [ ] New Zealand
- [ ] United Kingdom
- [ ] United States of America
- [ ] Other (please specify)

How old are you?

- [ ] 17 or under
- [ ] 18 or over (please specify your actual age)

Do you currently have a Facebook account?

- [ ] Yes
- [ ] No

On average, how much time per day do you spend on Facebook (for non-work related purposes)?

- [ ] 30 minutes or less
- [ ] 31-60 minutes
- [ ] 1-2 hours
- [ ] 2-4 hours
- [ ] 5-6 hours
- [ ] 6-8 hours
- [ ] More than 8 hours

How often do you use Facebook on devices other than your computer (for non-work related purposes)?

- [ ] Never
- [ ] Rarely
- [ ] Sometimes
- [ ] Often
What do you generally spend most of your time doing when you are using Facebook? (i.e., commenting on Friend's posts, looking at Photos, playing Games, etc.)?

Do you ever think about Facebook when you are not using it?

☐ Yes  ☐ No

What sort of thoughts do you have about Facebook when you're not using it?

The following questions ask about the mood or frame of mind you are in when you engage in various activities on Facebook. Please pay attention to the underlined section of each question to determine which activity is being referred to.

Would you say that you are generally in a particular mood or frame of mind when you decide to check Facebook?

☐ Yes  ☐ No

Please explain what sort of mood or frame of mind you are generally in when you decide to check Facebook:

Would you say that you are generally in a particular mood or frame of mind when you decide to update your status on Facebook?

☐ Yes  ☐ No

Please explain what sort of mood or frame of mind you are generally in when you decide to update your status on Facebook:
When answering the following question, please respond in terms of how you would usually spend most of your time when using Facebook (i.e., looking at your News Feed, playing Games, viewing Photos, etc.).

Would you say that you are generally in a particular mood or frame of mind when you are using Facebook?

Yes ☐ No ☐

Please explain what sort of mood or frame of mind you are generally in when you are using Facebook.


Please indicate your level of agreement with the following question:

My Facebook usage is motivated by a desire to be social, or to feel connected to others.

Strongly Disagree ☐ Disagree ☐ Neither Agree nor Disagree ☐ Agree ☐ Strongly Agree ☐

Does socialising on Facebook feel different to you than socialising in real life?

Yes ☐ No ☐

Please explain how socialising on Facebook is different to socialising in real life:


Have you ever been in a situation when you couldn't or didn't access Facebook for a long period of time (i.e., a week or longer)?

Yes ☐ No ☐

Why did you stop accessing Facebook during that time?


How long were you without Facebook access?

How did you feel during this time?

How do you think you would feel if you couldn't access Facebook for a long period of time (i.e., a week or longer)?

Can you think of any instances when your Facebook use interfered with your normal daily activities (i.e., it distracted you from work, study, or social events)?

- Yes
- No

Please provide an example of any such instances:

Can you think of any instances when your Facebook use has caused problems with your personal relationships?

- Yes
- No

Please provide an example of any such instances:
Have you ever been told by someone that you spend too much time using Facebook, or that you use Facebook in a problematic way?

- Yes
- No

Please provide an example of any such instances:

How concerned are you about your Facebook use?

- Not at all concerned
- Mildly concerned
- Moderately concerned
- Very concerned
- Extremely concerned

Please explain what concerns you about your Facebook use:

Thank you for your time. You have now successfully completed the first part of the research project.

Would you like to participate in an anonymous online focus group to discuss your concerns about your Facebook use?

- Yes
- No

The second part of this research project involves participation in focus groups hosted on a private online forum. In order to take part in the online focus groups, you will need to create a forum username. To ensure that your anonymity is protected, your forum username must not be your real name, or any existing pseudonym that you have used on the Internet in the past. It is strongly recommended that you create a new pseudonym for the purposes of this research project. Please choose a pseudonym that you will remember, as you will be required to enter it whilst registering for the online forums.

Please enter your forum username below (must be between 3 and 20 characters):
Please click the 'Next' button below to submit your survey responses. You will then be automatically redirected to the online focus group registration page.

You will need to register for the forum in order to participate in the focus group. While registering, remember to enter the same forum username that you entered on the previous page. Failure to do so will mean that you will be blocked from the forum.

Once you have registered and logged in, please enter the forum titled ‘Welcome’ to receive further instructions.
## Appendix H: Multicollinearity Tests

### Coefficients\(^a\)

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<th>Model</th>
<th>Coefficient</th>
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\(^a\)Dependent Variable: Presence of Facebook Addiction

### Collinearity Diagnostics\(^a\)

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\(^a\)Dependent Variable: Presence of Facebook Addiction