AN INVESTIGATION OF THE ANTECEDENTS AND CONSEQUENCES OF "PHUBBING": HOW BEING SNUBBED IN FAVOUR OF A MOBILE PHONE PERMEATES AND AFFECTS SOCIAL LIFE

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Declaration of Authorship

The research reported in this thesis is my own, except where indicated, and has not been submitted for a higher degree at any other institution.

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Abstract

Smartphones have changed the way people interact with each other in modern society. However, while they are becoming more omnipresent in human life, there is increasing concern that they are often used at inappropriate times during social interactions, and that people often ignore others in favour of their phones. In this thesis, we explore the phenomenon of "phubbing" – the act of snubbing someone in a social setting by concentrating on one's mobile phone. In a series of ten empirical studies, we demonstrate that Internet addiction, fear of missing out, and self-control predict smartphone addiction, which in turn predicts the extent to which people phub. This path also predicts the extent to which people feel that phubbing is normative, both via (a) the extent to which people are phubbed themselves, and (b) independently. Phubbing also significantly dampens perceived communication quality and relationship satisfaction in dyadic conversation. These effects are mediated by reduced feelings of belonging and both positive and negative affect. In addition, the results indicate that the degree to which someone is affected by phubbing is not determined by the relationship status between phubber and phubbee. We also develop and validate the Generic Scale of Phubbing (GSP) to assess phubbing behaviour, and the Generic Scale of Being Phubbed (GSBP) to assess the experience of being phubbed. Both scales reveal good psychometric properties. In conclusion, the results of the current research allow us to better understand how phubbing permeates and affects human social life.

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Chapter 1: Understanding Phubbing

Abstract

Historically, human life has almost always been changed by the introduction of new technologies to a society. Modern communication technologies have changed the way we learn, work, live, and connect with one another. While mobile phone technology may enable people to stay in touch instantly and continuously, the intrusion of smartphones into face-to-face interactions is already having effects on social norms and modes of human interaction, with the potential to lead to massive social changes. One example of such a change is the phenomenon of 'phubbing', which refers to snubbing someone with whom one is face-to-face in favour of engaging with one's smartphone. Chapter 1 considers a compelling, although still limited, area of research exploring the phenomenon of phubbing. The present chapter reviews the relevant extant literature on phubbing, from the emergence of phone snubbing behaviour to the effects of being phubbed, and then considers evidence regarding how phubbing and the experience of being phubbed have been measured in prior research. Along the way, this chapter also highlights important findings and limitations of previous studies related to phubbing.

In the past century, modern technology revolutionised the lives of every human being. While modern technology has become more accessible, reliable, and affordable, the way people in our society live has gradually been shaped and transformed by technology (Johnson, 1999). People might not experience an abrupt change, but still feel that it has made their lives better, simpler, and faster (Williams & Edge, 1996). Communication has always played a vital part in human history. When it comes to the way people communicate, information and communication technology has had a profound influence on everyone's daily life, and has also disrupted the way people interact with each other in general (Holmes, 2005; C. A. Lin, 2003). Before the 1870s, people mainly connected to their distant peers via letter writing or telegram (Wenzlhuemer, 2007). The limitation of these communication methods allowed the sender to communicate only one message at a time, in one direction at a time. It might take hours (for telegrams) or days (for letters) before the message would be received (Standage, 1998). As had been the case with the telegram, the telephone was invented to help people communicate over vast physical distances, while providing the additional advance of instant bidirectional communication (Coe, 1995). The advent of the telephone minimised the barriers of geographical location and allowed users to communicate conveniently in real-time with people in distant locations, which was an advantage over the telegram (Winston, 2002).

Although the conventional telephone was not initially embraced by everyone, it was gradually adopted by society within 50 years of its invention (Fischer, 1994; Winston, 2002). The influence of the telephone was most significant in the way it shaped human behaviour. In the early days of the fixed telephone, people learnt how to make successful connections with each other by arranging specific times at which to talk (Şenbıl, 2009).

People then learnt how to maintain a large social circle of friends without coming together and having face-to-face meetings. By the late 1910s, telephoning became a cultural activity when the middle and upper classes began to use this device as a tool to enhance their sociability (Mercer, 2006). Therefore, people cautiously established rules and etiquette of telephoning in society, such as being courteous and considerate over the telephone, as if the interaction was occurring face-to-face (Fischer, 1994). However, the invention of the phone also led to many predictions about societal changes, which later actually came about. Some of these included social decentralisation and changes in marketing and business, in turn causing outdated communication services to lose business. In addition, whereas the work of medical professionals, police officers, and emergency workers was supported by these changes, they also served to aid criminals, and changed people's norms connected to privacy (de Sola Pool, 1977). Now most homes are equipped with fibreoptic cables, and people can conduct their telephone communication wirelessly. Since the 1990s, people no longer needed to stay in a fixed place in order to have a phone conversation (Lacohée, Wakeford, & Pearson, 2003). The mobile phone has spread globally at an incredible pace, at the same time as the largest global computer communication network – the Internet – has proliferated.

In the mid-1990s, the Internet transformed human life toward a more enlightened existence, where it has become more popular and diffused into the everyday life of many North Americans and Europeans (Hauben & Hauben, 1998; Marson, 1997). The Internet redefined how people live, learn, and communicate by connecting people to people, information, knowledge, and entertainment anywhere globally, at any time, in an effortless manner (DiMaggio, Hargittai, Neuman, & Robinson, 2001; Jenkins, Ford, & Green, 2018;

Rheingold, 1993). By 2018, the numbers of Internet users had increased by 7% year-on-year since 2017, reaching 4.09 billion, or 54% of the world's population (Kemp, 2018). People are now spending more time on the Internet. The Global Digital Report 2018 (We Are Social, 2018) revealed that people spend approximately six hours per day using Internet-powered devices and services, more than one-third of their waking life. With four billion Internet users globally, people are projected to spend a combined total of one billion years online in 2018 (Kemp, 2018). The outcome of Internet growth has driven what used to be off-line activities, such as talking to friends face-to-face, to become online activities such as chatting on social media (Jenkins et al., 2018). It has sometime relocated children's activities from outdoors to indoors and online. A survey revealed that British children spend more than 20 hours per week online, and just over four hours a week playing outside, only half of the time their parents' generation did (Moss, 2013). The Internet has revolutionised human societies and social interactions, especially when combined with mobile phones. This led the telecommunications industry to the creation of the new breed of advanced mobile phones, which function much like computers, driven by the demand for more advanced real-time interaction with others.

The Era of Smartphones

Recent years have also seen an explosion in communication technology, creating devices and systems that support one-to-one, one-to-many, and many-to-many human interactions (Gummesson, 2004; Huang, Lee, & Hwang, 2009; Tews, Sukhatme, & Matarić, 2002). Smartphones enable people to communicate with anyone anywhere, facilitating social interactions with people who are very close by, or on the other side of the world. They particularly provide opportunities for users to connect with friends, family,

colleagues and absent others (Andreassen & Pallesen, 2014; Do & Gatica-Perez, 2013; Echeburua & de Corral, 2010; Kuss & Griffiths, 2011; N. Park, Kee, & Valenzuela, 2009); play games (Cheok, Sreekumar, Lei, & Thang, 2006); enjoy entertainment (Zhang, Chen, & Lee, 2014); benefit from education (Cummiskey, 2011); and research (Raento, Oulasvirta, & Eagle, 2009). Moreover, activities such as web surfing, playing games, watching entertainment online, and instant messaging have driven the growth in Internet use on smartphones all over the world.

Smartphones have become an integral part of people's daily lives (Jones, 2014; Oulasvirta, Rattenbury, Ma, & Raita, 2012; Roberts, Yaya, & Manolis, 2014), and have overtaken personal computers and laptops as the device people most commonly use to access the Internet (Buckle, 2016). Interpersonal communication has also shifted from telephone calls to primarily instant messaging (Oulasvirta et al., 2012). This shift in communication paradigm is a good example of how the technology landscape for people has evolved since the beginning of the smartphone era. Most notably, sales of smartphones dominate the global share of communication devices, with the number of mobile phone users, currently at 5.14 billion, or 68% of the world's population, up 4% year-on-year (Kemp, 2018). In the UK, the smartphone penetration rate is expected to reach 90% of adults by 2020. Deloitte's Global Mobile Consumer Survey 2017 (Deloitte, 2017) revealed that UK teenagers check their smartphones on average around 90 times per day, three times more often than their parents and seven times more often than their grandparents. More than a third (34%) of UK adults check their smartphones first thing in the morning, and more than three-quarters (78%) do so within an hour before going to sleep. The time per day that UK adults spend on smartphones has leapt from 73 minutes in 2014 to 119 minutes

in 2017, driven by a shift from the use of computers to phones for accessing social media (eMarketer, 2017).

The smartphone is currently the primary device used for going online, bringing more than half of the global population online on their mobile devices (Kemp, 2018). Social networking sites and mobile social applications are now the key formats for instant communication over vast distances (Newman, Fletcher, Kalogeropoulos, Levy, & Nielsen, 2017). Mobile social media users surpassed the three-billion mark in April 2018, with 93% of social media users accessing the platforms from their mobile devices (Kemp, 2018). Without the mobile communication technologies currently available, it would be difficult to sustain the mobile and dispersed personal and professional networks of our society. However, despite their obvious advantages in bringing people together, smartphones may sometimes pull people apart (Turkle, 2012). In particular, people often ignore others with whom they are physically interacting in order to use their smartphone instead.

Phubbing

Despite the obvious benefits of smartphones, in recent years researchers have become increasingly concerned about their potential adverse effects on mental and physical health, and on the quality of social interactions (Baron & Campbell, 2012; Campbell & Kwak, 2010; Choliz, 2010; J. H. Ha, Chin, Park, Ryu, & Yu, 2008; Khan, 2008; Y. Lee, Chang, Lin, & Cheng, 2014). Just as many people have become addicted to the Internet, more and more people are becoming problematic smartphone users, causing concern about the potential consequences of smartphone overuse (e.g., Beranuy, Oberst, Carbonell, & Chamarro, 2009). People constantly use mobile applications on their smartphones, regardless of where they are or who they are with. People interact with the smartphone

rather than with the person or people present. This phenomenon is called phubbing, from the combination of 'phone' and 'snubbing': to snub someone in favour of one's phone (Pathak, 2013). The word was introduced in 2012 as a part of a marketing campaign launched by the Australian advertising agency McCann Australia, which was meant to promote the new edition of the Macquarie Dictionary. A group of linguistic and marketing experts gathered at the University of Sydney to coin a new term that represented an offensive mobile phone use behaviour for which there was no previous term. They defined it as "the act of snubbing someone in a social setting by looking at your phone instead of paying attention" (McCANN, n.d.). The concept of phubbing spread globally at an incredible pace since the launch of the most well-known anti-phubbing campaign, called "Stop Phubbing", in 2013. The Australian graduate student Alex Haigh and the McCann agency started a campaign in an effort to end phubbing behaviour in society, and their message instantly attracted enormous attention from press around the world (Steinmetz, 2013). Their social initiative website portrayed engaging statistics through a series of visual graphics, such as "an average dining restaurant has 36 cases of phubbing per night" and "97% of people report a bad taste of their food while being phubbed" (Haigh, n.d.).

People may not have been familiar with the term phubbing at the beginning of the campaign, but most of them recognised it once it had been explained. It occurs in a variety of situations and seems to have become routine among those with access to such devices (Chotpitayasunondh & Douglas, 2016). One recent study reported that 90% of respondents used their smartphones during their most recent social activity, and also perceived that 86% of others involved in the social interaction did the same (Ranie & Zickuhr, 2015). Another

recent study showed that nearly half of adult respondents reported being phubbed by their romantic partner (Roberts & David, 2016).

Yet phubbing behaviour is also frequently highlighted in the act of ignoring one's conversation partner(s) during face-to-face interaction (Chotpitayasunondh & Douglas, 2016; David & Roberts, 2017; Haigh, n.d.; Karadağ et al., 2015; Karadağ et al., 2016). In fact, many researchers have extended the definition of phubbing by including the act of snubbing people in a social activity or a social setting of two or more people (Abeele, Antheunis, & Schouten, 2016; Abramova, Baumann, Krasnova, & Lessmann, 2017; Chotpitayasunondh & Douglas, 2016; Ugur & Koc, 2015). Phubbing has also been labelled as a sign of dislike and disinterest (Abeele et al., 2016). In the current thesis, phubbing refers to the act of partially or completely ignoring face-to-face interaction partner(s) in a social activity of two or more people by paying attention to one's mobile phone instead of initiating or maintaining an interaction with the person(s) directly in one's company. In other words, phubbing can happen either before or in the midst of real-life conversation and other types of social activity. However, phubbing may not count in a situation in which interaction is not expected or presumed, such as paying attention to one's phone rather than classmates during a lecture, or to companions in a movie theatre.

Phubbing is sometimes called "technoference" (e.g., McDaniel & Coyne, 2016; McDaniel & Radesky, 2018). A combination of the words "technology" and "interference", technoference is the term given to the intrusions and interruptions to social interaction caused by technology devices (McDaniel & Coyne, 2016). However, according to Google Trends data, the term "technoference" is not nearly as commonly used as phubbing (Google Trends, n.d.).

‘Being phubbed’ happens at the receiving end of phubbing behaviour. The term of ‘being phubbed’ is often conceptualised as the experience of being snubbed by companion(s) in a face-to-face social interaction activity because one’s companion(s) pay attention to their phones instead (Chotpitayasunondh & Douglas, 2016, 2018; David & Roberts, 2017; Karadağ et al., 2016). Apart from the term ‘being phubbed’, researchers have coined various terms associated with the experience of being snubbed by phubbers, such as ‘phubbee’ (a person who is phubbed in a social situation, either partially or extensively; Chotpitayasunondh & Douglas, 2016, 2018), ‘pphubbing’ (being phubbed by spouse or significant other; Roberts & David, 2016), and ‘bphubbing’ (being phubbed by bosses or employees’ supervisors; Roberts & David, 2017).

Phubber and Phubbee

People can be phubbers themselves and be phubbed by other people at the same time. Ignoring interaction partners in favour of one’s smartphone may cause phubbing behaviours to be reciprocated (Chotpitayasunondh & Douglas, 2016, 2018). Individuals may remain silent or exhibit reactive behaviours when they are phubbed (Karadağ et al., 2016). The term ‘phubber’, i.e., a person who starts phubbing his/her companion(s) in a social situation, was also mentioned in many articles (e.g., Karadağ et al., 2016; Nazir & Pişkin, 2016; Ugur & Koc, 2015). For the purpose of the current study, a ‘phubber’ is defined as a person who starts snubbing someone in a social situation by paying attention to their smartphone instead, and a ‘phubbee’ is defined as a person who is ignored by their companion(s) in a social situation because their companion(s) uses or checks their smartphones instead. The term ‘phubbee’ has also been mentioned in some articles (e.g., Cizmeci, 2017; Roberts, 2016).

What Causes Phubbing and Why Does It Happen?

Phubbing behaviour is considered a multidimensional structure. Karadağ et al. (2015) revealed that the construct of phubbing in university students may consist of mobile phone addiction, SMS addiction, social media addiction, Internet addiction, and game addiction. However, many components proposed in the study overlapped and were entirely dependent on each other. In an attempt to simplify the construct of this behaviour, those factors can be categorised into only smartphone addiction and Internet addiction. There are theoretical reasons for expecting the phubbing behaviour construct to relate to the constructs associated with mobile phone use behaviour, such as Internet addiction and smartphone addiction, as well as fear of missing out. Cognitively, the phubber may have an inability to monitor or control their smartphone use and Internet use appropriately, compulsive apprehension of missing an opportunity for other satisfying events, and an inability to regulate mobile phone use behaviour and etiquette.

Smartphone Addiction

Researchers have focused on the effects of excessive smartphone use on mental and physical health (Jenaro, Flores, Gómez-Vela, González-Gil, & Caballo, 2007). Findings suggest that smartphone users who show a tendency to be addicted to their phones appear more likely to experience health problems, in a similar way to how those who show a tendency toward Internet addiction (Beranuy et al., 2009) and game addiction (Y. H. Lee, Ko, & Chou, 2015) experience health problems. In addition, smartphone addiction and Internet addiction have been found to be associated with depression (Beranuy et al., 2009; Thomée, Härenstam, & Hagberg, 2011) and anxiety (Cheever, Rosen, Carrier, & Chavez, 2014; Dalbudak et al., 2013; Lepp, Barkley, & Karpinski, 2014). Finally, aggression and a

lack of attention have been found to be associated with Internet and smartphone addiction in children (Davey & Davey, 2014; C. Park & Park, 2014). Therefore, there appears to be reason for concern about the consequences of smartphone overuse for the individual.

The consequences of smartphone use for the quality of social interactions between individuals have also caused concern. Specifically, Habuchi (2005) argued that mobile phones can diminish the quality of interpersonal interactions, producing a "tele-cocooning" effect, where people are diverted from face-to-face exchanges with others and therefore lose the art of face-to-face interaction (Habuchi, 2005). In other research, conversations where smartphones were present reported lower levels of empathic concern compared to those in the absence of a smartphone on the table (Misra, Cheng, Genevie, & Yuan, 2014). Other researchers have found lower levels of perceived relationship quality, partner trust, and perceived empathy in the presence of mobile phones (Roberts & David, 2016; Przybylski & Weinstein, 2013). Many media reports have also commented on the intended and unintended disconnection among people that occurs when people use smartphones (Barford, 2013; Kelly, 2015; Mount, 2015).

Possible Predictors of Smartphone Addiction and Phubbing

In order to identify the predictors of smartphone addiction and phubbing, the Four Ps model of case formulation was adopted. The Four Ps has been widely used by mental health practitioners to provide a conceptual framework imposing a chronology and an etiology on the problematic behavioural formulation. This model conceptualises the individual's behavioural response or problem into predisposing, precipitating, perpetuating, and protective factors (Winters, Hanson, & Stoyanova, 2007). Predisposing factors are the constellation of features that put an individual at risk of developing a behavioural problem

(in this case smartphone addiction and phubbing). These may include medical and mental health problems, such as internet addiction. Precipitating factors refer to the factors which exacerbate the behavioural response or problem, while perpetuating factors refer to the factors which maintain the individual's behaviour or problem. Some factors can trigger, as well as maintain, the problem once it has become established. For example, fear of missing out on what others are doing may both trigger and maintain the desire of an individual to stay continually connected to the smartphone. Finally, protective factors, such as self-control, are the factors which can prevent or lessen a particular behaviour of an individual.

First, *Internet addiction* has been defined as a "maladaptive pattern of Internet use leading to clinically significant impairment or distress" (Goldberg, 1996, p.1). Some researchers argue that problematic smartphone behaviour is closely related to Internet addition and may have some similar consequences. Specifically, researchers investigating *smartphone addiction* have shown that, like Internet addiction, problematic smartphone use is associated with withdrawal, intolerance, compulsive behaviour and functional impairment (Mok et al., 2014; Y. H. Lin et al., 2014; Takao, Takahashi, & Kitamura, 2009). Excessive smartphone use and compulsive smartphone checking are also associated with interpersonal relationship problems such as inhibition of interpersonal closeness and trust development (Przybylski & Weinstein, 2013), interference with other social activities (Walsh, White, & Young, 2008), and insecurity in romantic relationships (Kuss & Griffiths, 2011). Moreover, in a recent study, Internet addiction was positively related to phubbing behaviour (Karadağ et al., 2015). It is therefore reasonable to suggest that problematic Internet use would be associated with problematic smartphone use, which in turn may predict phubbing behaviour.

Second, the predictive value of *fear of missing out* (FoMO) also needs to be factored in. FoMO refers to "the fears, worries, and anxieties people may have in relation to being in (or out of) touch with the events, experiences, and conversations happening across their extended social circles" (Przybylski, Murayama, DeHaan, & Gladwell, 2013, p.1842). FoMO debilitates people by arousing their insecurities and has been found to be associated with persistent mobile phone overuse (Carbonell, Oberst, & Beranuy, 2013). This anxiety about being left out of the information circuit also plays a crucial role in seeking out social networking services, need satisfaction, life satisfaction, and mood (Przybylski et al., 2013), which have all been connected to levels of smartphone addiction (Davey & Davey, 2014; Kwon, Kim, Cho, & Yang, 2013; Salehan & Negahban, 2013). Recent research has found FoMO to be associated with problematic mobile phone use (Cheever et al., 2014; Hong, Chiu, & Huang, 2012; Lepp et al., 2014). It is therefore plausible to suggest that FoMO would predict mobile phone addition, which in turn may predict phubbing behaviour. The fear of missing important information on social media, for example, may be associated with problematic phone use, meaning that people then turn to their phones rather than interact with the people in their immediate presence.

Third, several studies have shown that *self-control* is closely related to addictive behaviour (Kim, Namkoong, Ku, & Kim, 2008; Malouf et al., 2014; Mehroof & Griffiths, 2010; Perry & Carroll, 2008; Tangney, Baumeister, & Boone, 2004) and has also been linked to problematic smartphone use (Billieux, Van der Linden, d'Acremont, Ceschi, & Zermatten, 2007). It is argued that, similar to substance-dependence related symptoms, people with an abnormally high sense of urgency or high levels of difficulty controlling their impulses may be unable to moderate their mobile phone use (Billieux, Van der Linden,

& Rochat, 2008). Meanwhile, lack of perseverance can disturb task focusing and increase the incidence of irrelevant cognitions (Bechara & Van Der Linden, 2005), which may also enhance the frequency of mobile phone use (Billieux et al., 2008). It is therefore reasonable to suggest that self-control, in predicting smartphone addiction, may in turn predict problematic smartphone behaviour in the form of phubbing.

Therefore, smartphone addiction itself should be a proximal predictor of phubbing behaviour. Phubbing and smartphone addiction may share the same properties because they are both related to inappropriate smartphone uses and behaviours. It seems inevitable that people who are addicted to their smartphones will use their device uncontrollably, even if it is discourteous, or at a time or place where it is prohibited (Bianchi & Phillips, 2005; Billieux et al., 2014; Jones, 2014; Walsh, White, Hyde, & Watson, 2008).

How Has Phubbing Become the Norm?

Phubbing behaviour, phubbers and phubbees can be commonly seen everywhere in today's modern society (Haigh, n.d.). A related question is therefore how this behaviour has become acceptable or normative. Understanding the relationship between the extent to which people phub and the extent to which they are phubbed is an important part of answering this question. The concept of reciprocity in social psychology plays a key role in understanding human interaction and social exchanges (Berg, Dickhaut, & McCabe, 1995; Cialdini, 1993; Falk & Fischbacher, 2006). Reciprocity occurs when someone returns a social action that has positive consequences for another (Pelaprat & Brown, 2012) or retaliates with an action, resulting in negative consequences (Keysar, Converse, Wang, & Epley, 2008). In terms of phubbing, ignoring companions in favour of the smartphone may cause such behaviours to be reciprocated, intentionally or unintentionally. In turn, and with

repeated reciprocity of phubbing behaviour, this may influence the extent to which phubbing is perceived to be normal or acceptable. In the past, social norms were often developed or recalibrated over decades or centuries (Axelrod, 1986; Miller & Prentice, 1996; Sherif, 1936). However, modern societies have always experienced dramatic shifts in new social norms, and people tend to adopt these norms rapidly (Sunstein, 1996). Norms are also derived from observable and personal behaviour (Miller & Prentice, 1996). It is therefore possible to gauge the extent to which observable behaviour (being phubbed) and personal behaviour (phubbing) can predict the extent to which people view phubbing as normative.

Gender

Gender has been found to play a crucial role in influencing many smartphone-associated behaviours, such as preference for online activities (Y. Ha & Hwang, 2014), mobile phone addiction (Baron & Campbell, 2012; Geser, 2006), Internet addiction (Geser, 2006; Jang & Ji, 2012), self-control (Nakhaie, Silverman, & LaGrange, 2000), and communication etiquette (Forgays, Hyman, & Schreiber, 2014). However, very little is currently known about how phubbing behaviour, being phubbed, and perceived social norms of phubbing differ between males and females. Meanwhile, gender also has a moderating effect on the relationship between social norms and many aspects of human consumption behaviour (Kolyesnikova, Dodd, & Wilcox, 2009) such as alcohol consumption (Lewis & Neighbors, 2004), Internet banking (Karjaluoto, Riquelme, & Rios, 2010), and online purchasing (Dittmar, Long, & Meek, 2004). It was recently found that gender plays a moderating role on the relationship between phubbing behaviour and both mobile phone and Internet addiction (Karadağ et al., 2015). It is therefore reasonable to

propose that gender plays an important role in determining phubbing behaviour, is associated with the antecedents of phubbing, and influences the extent to which phubbing is perceived as normative.

What Are the Effects of Phubbing?

Communication technology misuse can always lead to significant detrimental outcomes. Research on the effects of phubbing suggests that it may create negative, resentful reactions such that people perceive their interaction to be of poorer quality (Ranie & Zickuhr, 2015), are less satisfied with their interactions (Abeele et al., 2016), trust their interaction partner less (Cameron & Webster, 2011), feel less close to their interaction partner when a phone is present (Misra et al., 2014), feel jealous (Krasnova, Abramova, Notter, & Baumann, 2016) and deflated (Roberts & David, 2016).

Although we know that phubbing has some negative social consequences, it is not clear exactly why this is the case. For example, what drives the relationship between phubbing behaviour and decreased relationship satisfaction? Why is phubbing associated with poor perceived communication quality? To answer these questions, the current thesis frames phubbing as a specific form of social exclusion that threatens fundamental human needs and leads to deflated affect.

Social exclusion – or ostracism – is defined by Williams (2001) as "being invisible and being excluded from the social interactions of those around you" (p. 2). This experience of being a social outcast is detrimental to an individual's wellbeing (Baumeister, 2005). Social exclusion usually leads to negative emotional disturbances such as aggression (Twenge, Baumeister, Tice, & Stucke, 2001), anxiety (Baumeister & Tice, 1990), depression (Leary, 1990), and loneliness (Stillman et al., 2009). Moreover, social

exclusion can lead to detrimental effects on four fundamental human needs: the need to belong, the need for self-esteem, the need for meaningful existence, and the need for control (Gerber & Wheeler, 2009; Williams, 2001; Zadro, Williams, & Richardson, 2004), which in turn lead to reactions such as immediate physiological arousal, making self-affirmations in the short term, and self-imposed isolation in the long-term (Williams, 2001).

First, social exclusion threatens an individual's need to belong, demonstrating either explicitly or symbolically to a person that they are not wanted or valued (Jamieson, Harkins, & Williams, 2010). Second, social exclusion threatens the need to maintain high self-esteem since in some situations it can act as a form of punishment, forcing the individual to wonder what they did wrong (or what is wrong with them), or may lead to the feeling that they are not worthy of attention (Ferris, Lian, Brown, & Morrison, 2015; Williams, 1997). Third, an individual's need for meaningful existence is threatened by social exclusion because it represents social "death" and creates a feeling of invisibility (Case & Williams, 2004; Williams, 2007). Finally, social exclusion can threaten the need for control as people attempt to work out the uncertain situation (i.e., why are they being ignored?) but are unable to influence the situation, leading to feelings of hopelessness and helplessness (Bandura, 2000).

Immediately after being socially excluded, rejected individuals respond with threats to fundamental needs, physical and social pain, and negative affect (Williams, 2009a). In this thesis, we propose that people will respond to the experience of phubbing in a similar way. Specifically, we argue that phubbing can be considered a specific form of ostracism or social exclusion that threatens the four fundamental needs and also leads to negative emotional experiences. Phubbing has the crucial element of social exclusion in that

individuals are ignored by others – while they remain in the physical presence of other people, they are nevertheless shut out of social interaction. Like other forms of ostracism (see Williams, 1997), people may phub others either deliberately or without necessarily knowing they are doing so (Ranie & Zickuhr, 2015). Moreover, features and characteristics of phubbing, such as the withdrawal of eye contact, may further be experienced or interpreted (or misinterpreted) as being given the "silent treatment", or being socially rejected (Silk et al., 2012; Wirth, Sacco, Hugenberg, & Williams, 2010). Averted gaze is a passive form of social exclusion (Wirth et al., 2010), and a signal of disinterest (Richmond, McCroskey, & Hickson, 2008), and individuals on the receiving end tend to experience lower satisfaction of the four fundamental human needs compared to those who receive direct eye contact (Wirth et al., 2010). Phubbing therefore displays many of the most common features of social exclusion, thus it is plausible to suggest that phubbing could have similar detrimental effects on the fulfilment of social needs, and on how people feel.

While mobile-phone-induced ostracism has negative effects on need threats and moods (Gonzales & Wu, 2016), thwarted needs and negative affect in turn tend to have a corrosive effect on relational outcomes at the same time. For example, people who are deprived of the need for control tend to terminate or change the pattern of the relationship between source and target (Zadro, Arriaga, & Williams, 2008). Losing a sense of belonging can also be a symbolic message of losing a relationship or attachment to another individual or group. However, in some cases, people with threatened needs may attempt to regain them by strengthening their bonds and relationships with others (Williams, 2001). Besides threatened needs, emotions aroused by being phubbed may also play an integral role in the functioning of interpersonal relationships. According to the theory of attachment

(Bowlby, 1969, 1988), many emotions serve adaptive functions in human survival. Positive affect brings people closer, which in turn helps individuals to form, ensure, and maintain their relationships with others. In addition, positive emotions induce a greater likelihood of successful social interactions (Waugh & Fredrickson, 2006). By contrast, studies have revealed that negative affect does not lead to close relationships and relationship satisfaction (Levenson & Gottman, 1983). Moreover, extreme negative emotions (e.g., anger) can lead to deleterious effects such as poor relationship functioning and high interpersonal conflict (Sanford & Rowatt, 2004).

The Role of Relationship Status During Phubbing

The extent remains unknown to which the relationship between phubber and phubbee might affect the consequences of phubbing. Specifically, is it worse to be phubbed by a person who is liked or disliked? Research on more general effects of ostracism may help us predict how relationship status moderates the effects of phubbing.

However, the moderating effect of interpersonal relationship status on ostracism is still controversial. Some studies revealed that participants' basic human needs were threatened more when ostracised by friends or others close to them than when suffering the same treatment by acquaintances and strangers (Nezlek, Wesselmann, Wheeler, & Williams, 2012). Relationship evaluation is affected more when individuals are ostracised by a romantic partner than by strangers (Eisenberger, Lieberman, & Williams, 2003; Maner, DeWall, Baumeister, & Schaller, 2007). Another study demonstrated that the presence of a smartphone during a dyadic conversation was associated with lower levels of self-reported empathetic concern among participants who had a friendlier relationship with each other compared with those who were on less friendly terms (Misra et al., 2014). On

the contrary, from the perspective of expectancy violation (Burgoon, 1993), people tend to be less vulnerable to violation of their expectations of their conversation partner's behaviour when they know each other well. Moreover, they tend to perceive more damage to conversations when the conversation partners are less familiar (Burgoon, 1993).

However, some recent findings paint a different picture, for example that romantic partners might as well be strangers when they engage in social exclusion. In particular, need satisfaction levels were comparable when ostracised by a romantic partner or by strangers (Arriaga, Capezza, Reed, Wesselmann, & Williams, 2014). Other research revealed that having a mobile (text-based) conversation during an off-line interaction affected perceived conversation quality and social attraction in the same way, regardless of whether the parties involved were acquainted or not (Abeele et al., 2016). The moderating effect of group status on ostracism has also been widely studied. Research has revealed that the group status of the social exclusion source generally does not influence reactions to ostracism, and that the effects are equally negative for ingroups and outgroups (Gonsalkorale & Williams, 2007; Smith & Williams, 2004; van Beest & Williams, 2006; Zadro et al., 2004). Being ostracised appears to be painful even when the source is a trivial group (Bernstein, Sacco, Young, Hugenberg, & Cook, 2010). Moreover, Gonsalkorale and Williams (2007) revealed that being ignored by even as despised an outgroup as the Ku Klux Klan is as hurtful as ostracism by the ingroup (see also Wirth & Williams, 2009). A small minority of studies indicate more aversive responses to ingroup social exclusion compared to exclusion by an outgroup (Bernstein et al., 2010; Sacco, Bernstein, Young, & Hugenberg, 2014).

How Is Phubbing Measured?

Although many researchers have focused on the antecedents and consequences of phubbing behaviour and the experience of being phubbed, very little attention has been given to the development and validation of psychometrically sound measures of this phenomenon. Existing attempts at measuring phubbing and the experience of being phubbed are scarce and typically designed to address particular research questions in specific communicative contexts. Several studies have employed novel scales in an attempt to measure phubbing, the experience of being phubbed, and other issues around this behaviour. These include the Perceived Social Norms of Phubbing scale (PSNP; Chotpitayasunondh & Douglas, 2016), which was developed to measure the observations of others' phubbing behaviour and the inference of others' approval of phubbing, the Technology Device Interference Scale (TDIS; McDaniel & Coyne, 2016), and the Technology Interference in Life Examples Scale (TILES; McDaniel & Coyne, 2016), which were developed to measure how often participants perceive their partner to allow technology to interrupt time they spend together. However, there has been little consideration of the scale development process and the psychometric properties of the existing instruments, beyond noting the scales' internal consistency and factor loadings.

Only a few studies present the steps of scale development in greater detail. One of these is the 10-item Phubbing Scale (PS) for measuring phubbing behaviour, developed and validated by Karadağ et al. (2015). Exploratory factor analysis (EFA) was conducted on a pool of items, which was generated using data from focus group interviews. A two-factor structure was revealed with good reliabilities for each: $\alpha = .87$ for "communication disturbance" (i.e., a disturbance in one's existing communication by dealing with mobile

phones in a face-to-face communication environment); and $\alpha = .85$ for "phone obsession" (i.e., a need for a mobile phone in an environment lacking face-to-face communication). However, this PS scale has limited generalisability. The PS scale development was conducted on university students whose native language was Turkish, without any information of linguistic and cross-cultural adaptation of the PS scale. Other psychometric properties of the PS instrument, such as construct validity, concurrent validity, convergent validity, discriminant validity, and test-retest reliability, were not reported. EFA was not followed by confirmatory factor analysis (CFA) to cross-validate the EFA-informed a priori factor structure of measurement. The falsification potential of CFA is fundamental to construct validity and theory-driven scale development (Henson & Roberts, 2006). Moreover, several items do not, prima facie, seem to measure phubbing. For example, "When I wake up in the morning, I first check the messages on my phone" and "My mobile phone use increases day by day" may represent phone addiction in general rather than specific phubbing behaviour.

To measure the experience of being phubbed, the Partner Phubbing Scale (Pphubbing; Roberts & David, 2016) and the Boss Phubbing Scale (Bphubbing; Roberts & David, 2017) have been developed. The nine-item Pphubbing measure was created to assess respondents' romantic partner phubbing and study its effects on interpersonal relationships. The EFA results of an initial pool of items revealed a single-factor structure. Although data retrieved randomly from the general population may enhance generalisability of the Pphubbing scale, the replicability of the scale is somewhat questionable. The EFA and CFA were conducted on the same data set without random splitting. For cross-validation, a number of researchers suggested that the data-driven EFA

and theory-driven CFA should in all cases be carried out independently on the data set collected (Cabrera-Nguyen, 2010; Knafl & Grey, 2007; Worthington & Whittaker, 2006). The nine-item Bphubbing measure was adapted from the Pphubbing scale to assess respondents' boss/supervisor phubbing and study its relationships with employee engagement (Roberts & David, 2017). However, only internal consistency was provided, and no factor analysis results, neither EFA nor CFA, were reported. Moreover, both the Pphubbing and Bphubbing scales were developed to answer specific questions about being phubbed by specific people in specific contexts, and not about the general experience of being phubbed, which could be applied to a variety of people and a variety of contexts. Also, since there is evidence that being phubbed strongly relates to the multidimensional experience of being ostracised (Chotpitayasunondh & Douglas, 2018), it is possible that the general experience of being phubbed is not a unidimensional construct.

Overview of Studies

In Study 1, we investigate the contributing roles of factors associated with smartphone addiction and phubbing behaviour. We prove that phubbing relates directly to a level of smartphone addiction, while smartphone addiction has a multidimensional structure involving Internet addiction, fear of missing out, and lack of self-control.

Study 2 examines the effect of phubbing on social interactions. In this study, we investigate why phubbing has such deleterious effects on phubbees by using a novel method for studying social exclusion in dyadic conversations: animation. Specifically, we consider phubbing in social interactions as a specific form of social ostracism. This study provides experimental confirmation of the person being phubbed perceiving the interaction

with the communication partner as negative, and illustrates the mediation effects of fundamental human needs and affect.

Studies 3 and 4 address whether the consequences of phubbing depend on the interpersonal relationship between the phubber and phubbee. These studies experimentally examine how positive and negative relationship dynamics influence the consequences of phubbing.

Finally, Studies 5, 6, 7, 8, 9, and 10 present two unique, psychometrically sound measures: one to examine the behaviour of phubbing, and another to measure the experience of being on the receiving end of phubbing. Moreover, these studies provide all psychometric properties on two scales, i.e., construct validities, criterion validities, internal consistency reliabilities, and test-retest reliabilities.

Taken together, these studies present novel insight into and understanding of phubbing. In particular, they represent one of the first attempts to highlight not only the potential antecedents, consequences, and effects of phubbing, but also how phubbing becomes a pervasive norm in modern communication. Moreover, this thesis contributes a novel method for manipulating social ostracism in dyadic conversations by using animations, and psychometrically develops measures of phubbing and the experience of being phubbed.

Chapter 2: Antecedents and Consequences

Abstract

Chapter 2 presents the first study, which was designed to examine some of the psychological antecedents and consequences of phubbing behaviour. Study 1 examines the contributing roles of Internet addiction, fear of missing out, self-control, and smartphone addiction, and how the frequency of phubbing behaviour and of being phubbed may both lead to the perception that phubbing is normative. The results reveal that Internet addiction, fear of missing out, and lack of self-control predict smartphone addiction, which in turn predict the extent to which people phub. This path also predicts the extent to which people feel that phubbing is normative, both via (a) the extent to which people are phubbed themselves, and (b) independently. Furthermore, gender moderates the relationship between the extent to which people are phubbed and their perception that phubbing is normative. The present findings suggest that phubbing is an important factor in modern communication that warrants further investigation.

Study 1 appears in: Chotpitayasunondh, V., & Douglas, K. M. (2016). How "phubbing" becomes the norm: The antecedents and consequences of snubbing via smartphone. *Computers in Human Behavior*, *63*, 9-18.

In Chapter 1, we explained how modern communication technology has impacted many aspects of our lives and reshaped the way we live in various ways. Even though humans have developed technologies to improve social life, technology can affect people both positively and negatively. Excessive and inappropriate use of technology, such as smartphones, is known to often have harmful effects on mental health and people's social lives. Although researchers have begun to consider some of the negative impact of problematic smartphone use, such as phubbing, e.g., consequences for relationship satisfaction and personal wellbeing (Roberts & David, 2016), very little is known about what causes phubbing, and how it has become an acceptable or normative feature of modern communication. In the current chapter, we draw upon existing findings in other domains of communication (specifically Internet communication) to understand the factors that predict smartphone addiction and phubbing behaviour, and also how phubbing has become a strong norm of communication.

Study 1

The main aim of Study 1 is to examine the factors that predict phubbing behaviour, and explore the ways in which people redefine social communication norms, as their own behaviour changes along with that of those around them. In particular, we studied the contributing roles of Internet addiction, fear of missing out, and self-control in predicting smartphone addiction, and how smartphone addiction may lead to phubbing behaviour. Moreover, we also examined the potential effects of gender. Participants participated in an online study where they completed scales to measure each of the above variables.

Drawing on our literature review, we developed a research model to explicate the key determinants of phubbing behaviour and the perceived social norms of phubbing. The

predicted model is depicted conceptually in Figure 1. We hypothesised that Internet addition and FoMO would positively predict smartphone addiction, and that self-control would negatively predict smartphone addiction. Next, we predicted that smartphone addiction would positively predict phubbing behaviour. Furthermore, we hypothesised that phubbing behaviour would positively predict the extent to which people are phubbed. We also predicted that both phubbing and being phubbed would positively predict the extent to which people perceive phubbing as normative. Finally, we predicted that gender would moderate the relationships between each determinant in our proposed model.

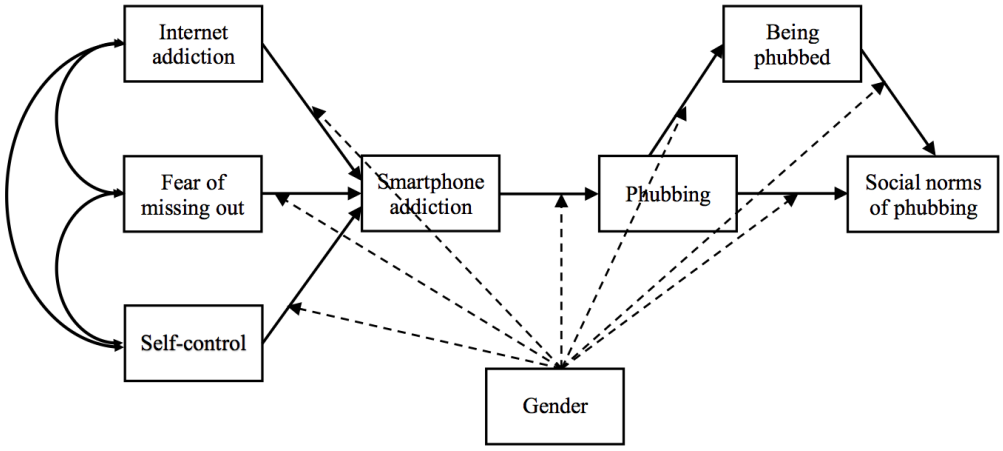

Figure 1. Proposed conceptual phubbing model using path analysis

Method

Participants

After giving their informed consent, an online questionnaire designed via Qualtrics software was completed by two hundred and seventy-six participants (102 men and 174 women) ranging in age from 18 to 66 (M = 28.09, SD = 9.64) and comprising 88 undergraduate students at the University of Kent (who participated for course credit), 88

participants from Amazon's Mechanical Turk (MTurk), and 100 volunteers from personal contacts on social networking sites. Eight participants (2.90%) who chose *"No, I do not use a smartphone"* as a response to any question in this study were excluded. Then we removed 17 participants (6.16%) who did not complete the questionnaire. In total, 251 participants (93 men and 158 women) ranging in age from 18 to 66 (M = 27.70, SD = 9.59) remained in the study. The demographics of the sample are presented in Table 1.

Table 1

General Characteristics of Participants by Gender

Characteristics	Male N=93 % (n)	Female N=158 % (n)	Total N=251 % (n)
Age (years)			
Mean ± SD	30.30 ± 10.18	26.17 ± 8.90	27.70 ± 9.59
Occupation			
Attending university Full-time	30.11 (28)	48.73 (77)	41.83 (105)
Working Full-time	47.31 (44)	30.38 (48)	36.65 (92)
Attending university Part-time	7.53 (7)	11.39 (18)	9.96 (25)
Working Part-time	8.60 (8)	3.80 (6)	5.58 (14)
Currently unemployed	6.45 (6)	5.70 (9)	5.98 (15)
Education			
No formal education	1.08 (1)	0.63 (1)	0.80 (2)
Primary level education	1.08 (1)	0.63 (1)	0.80 (2)
Secondary level education	25.81 (27)	43.67 (69)	38.25 (96)
College education (Bachelor's)	40.86 (38)	34.81 (55)	37.05 (93)
College education (Graduate)	27.96 (26)	20.25 (32)	23.11 (58)
Ethnicity			
White/Caucasian	58.06 (54)	56.96 (90)	57.37 (144)
Black British Caribbean	0.00 (0)	0.63 (1)	0.40 (1)
Black British African	1.08 (1)	7.59 (12)	5.18 (13)
Other Black background	0.00 (0)	1.27 (2)	0.80 (2)
Asian British Indian	0.00 (0)	1.27 (2)	0.80 (2)
Asian British Pakistani	0.00 (0)	1.90 (3)	1.20 (3)
Chinese	8.60 (8)	8.23 (13)	8.37 (21)
Other Asian background	24.73 (23)	14.57 (23)	18.33 (46)
African American	2.15 (2)	1.27 (2)	1.59 (4)
Hispanic	1.08 (1)	1.27 (2)	0.40 (1)
Other (including mixed ethnicity)	2.15 (2)	5.06 (8)	3.98 (10)
Rather not say	2.15 (2)	1.27 (2)	1.59 (4)

Materials and Procedure

The study employed the phubbing questionnaire, Smartphone Addiction Scale – Short Version (SAS-SV), Internet Addiction Test (IAT), Fear of Missing Out Scale (FoMOs), and Brief Self-Control Scale (BSCS).

Phubbing questionnaire. Initially, phubbing frequency and frequency of being phubbed were measured using items scored (1) never, (2) less often, (3) once weekly, (4) 2 times or more per week, (5) once daily, (6) 2-3 times per day, (7) 4-5 times per day, (8) 6-9 times per day, (9) 10 times or more per day. Regarding the small numbers of participants in some response categories, the nine categories for phubbing and being phubbed were collapsed into four (less often, less than once daily, 1-3 times per day, and 4 times or more per day). Meanwhile, phubbing duration and duration of being phubbed (per day) were measured using items scored (1) less than 15 minutes, (2) 15-30 minutes, (3) 30-60 minutes, (4) 60-90 minutes, (5) 90-120 minutes, (6) 2-3 hours, (7) 4-6 hours, (8) more than 6 hours. Again, because of low frequency of some choices, we collapsed duration categories into four (less than 15 minutes, less than an hour, 1-2 hours, and more than 2 hours). Phubbing frequency and phubbing duration were summed to create one score for overall phubbing behaviour. Furthermore, scores for the frequency and duration of being phubbed were summed to create an overall score of being phubbed. To assess familiarity with the term "phubbing", participants were asked "Do you know what the term "phubbing" means?" (yes or no).

Last, we measured perceived social norms of phubbing. Three items measured descriptive norms that are based on observations of others' behaviour (Borsari & Carey, 2003). Items were: "Are you familiar with this type of situation?", "Do you think that

people recognise phubbing behaviour?", and "Do you think that phubbing behaviour is typical among people around you?" (1 = not at all, 2 = a little, 3 = somewhat, 4 = quite a bit, 5 = very much; M = 10.99, SD = 2.36). Two items measured injunctive norms, which are related to the inference of others' approval of phubbing (Borsari & Carey, 2003). These were: "Do you think that phubbing behaviour is appropriate?" and "Do you think that other people view phubbing behaviour as appropriate?" using the same response categories as the previous set of questions (M = 4.06, SD = 1.38). Although both were included in the study, we expected no differences in relationships associated with descriptive and injunctive norms, hence they were combined to a general measure of perceived social norms of phubbing in our predicted model.

Smartphone addiction scale - short version (SAS-SV). This scale was developed from the original 33-item Smartphone Addiction Scale (SAS). This involved participants rating their agreement with 10 items (1 = strongly disagree; 6 = strongly agree; $\alpha = .91$, M = 27.00, SD = 10.11) such as "Missing planned work due to smartphone use", "Won't be able to stand not having a smartphone", and "The people around me tell me that I use my smartphone too much" (Kwon et al., 2013). In this study, 32.3% of female and 29% of male participants scored over the cut-off value of smartphone addiction (higher than 31 for men and 33 for women).

Internet addiction test (IAT). This scale contains 20 items consisting of eight items based on the DSM-IV criteria (Diagnostic and Statistical Manual of Mental Disorders, 4th Edition) for pathological gambling and alcoholism such as "How often do you find that you stay online longer than you intended?" and "How often do your grades or school work suffer because of the amount of time you spend online?", along with 12 new

items such as “How often do you form new relationships with fellow online users?” and “How often do you lose sleep due to late-night log-ins?” (Young, 1998). Participants responded on a 5-point scale (1 = rarely; 5 = always; α = .89; Frangos, Frangos, & Sotiropoulos, 2012) to measure mild, moderate, and severe addictive behaviour. The scores can range from 20 to 100; the higher the score, the greater the problems that the Internet causes. Young (2009) suggested that a score ranging from 20 to 49 points is an average online user who has no problem in controlling Internet usage. A score ranging from 50 to 79 indicates experiencing occasional or frequent problems due to Internet usage, and a score ranging from 80 to100 signifies significant impacts on a person’s life directly caused by Internet usage. In this study, the mean IAT score was 33.05 (SD = 14.79). The majority of participants (n = 217, 86.5%) were categorised as average users. Thirty-three participants (13.1%) were problematic users and only one male participant was categorised as an addictive user.

Fear of missing out scale (FoMOs). The Fear of Missing Out scale (FoMOs), developed by Przybylski et al. (2013) contains 10 items to assess fear of missing out phenomena such as “I fear others have more rewarding experiences than me”, “I fear my friends have more rewarding experiences than me”, and “I get worried when I find out my friends are having fun without me”. Participants responded on a 5-point scale (1 = not at all true for me, 5 = extremely true of me; α = .90, M = 2.19, SD = 0.79).

Brief self-control scale (BSCS). The Brief Self-Control Scale (Tangney et al., 2004) is a 13-item questionnaire asking participants to rate how well statements (e.g., “I am good at resisting temptation”, “I have a hard time breaking bad habits”, and “I never allow

myself to lose control") describe them on a 5-point scale (1 = not like me at all; 5 = very much like me, $\alpha = .85$, $M = 40.48$, $SD = 8.23$).

Results

All statistical tests were performed using SPSS Statistics version 23.0 and AMOS version 23.0 for Windows. Participants' reported frequency and duration of phubbing and being phubbed are shown in Table 2.

Table 2

General Characteristics of Phubbing Behaviour and Being Phubbed as a Function of Gender

Characteristics	Male N=93 % (n)	Female N=158 % (n)	Total N=251 % (n)
Phubbing frequency			
Less often	46.2 (43)	21.5 (34)	30.7 (77)
Less than once daily	25.8 (24)	25.3 (40)	25.5 (64)
2-3 times per day	21.5 (20)	29.7 (47)	26.7 (67)
4 times per day or more	6.5 (6)	23.4 (37)	17.1 (43)
Phubbing duration			
Less than 15 minutes per day	77.4 (72)	52.5 (83)	61.8 (155)
Less than an hour per day	17.2 (16)	36.7 (58)	29.5 (74)
1-2 hours per day	5.4 (5)	4.4 (7)	4.8 (12)
More than 2 hours per day	0.0 (0)	6.3 (10)	4.0 (10)
Frequency of being phubbed			
Less often	32.3 (30)	15.2 (24)	21.5 (54)
Less than once daily	31.2 (29)	17.7 (28)	22.7 (57)
2-3 times per day	25.8 (24)	35.4 (56)	31.9 (80)
4 times per day or more	10.8 (10)	31.6 (50)	23.9 (60)
Frequency of being phubbed			
Less than 15 minutes per day	67.7 (63)	44.9 (71)	53.4 (134)
Less than an hour per day	24.7 (23)	43.0 (68)	36.3 (91)
1-2 hours per day	6.5 (6)	10.8 (17)	9.2 (23)
More than 2 hours per day	1.1 (1)	1.3 (2)	1.2 (3)

Predictors of Phubbing Behaviour

As shown in Table 3, a Spearman's rank-order correlation was computed to assess the relationships among variables. All correlations between variables in this study were statistically significant in the expected directions. Self-control negatively predicted smartphone addiction, whereas Internet addiction and FoMO positively predicted smartphone addition. There was also a positive correlation between smartphone addiction and phubbing behaviour, and between phubbing behaviour and being phubbed. Moreover, both phubbing behaviour and being phubbed positively correlated with the extent to which people perceived phubbing as normative.

Table 3

Descriptive Statistics and Spearman Correlations Among Study Variables

Variables	1	2	3	4	5	6	7	M	SD
1. SAS-SV	--	.66**	.61**	-.39**	.49**	.29**	.23**	27.00	10.11
2. IAT		--	.58**	-.40**	.39**	.28**	.26**	33.05	14.79
3. FoMOs			--	-.39**	.33**	.22**	.15*	21.90	7.89
4. BSCS				--	-.31**	-.20**	-.21**	40.48	8.23
5. Phubbing					--	.59**	.28**	3.81	1.61
6. Being phubbed						--	.28**	4.16	1.58
7. Social Norms of phubbing							--	15.04	2.94

Note. * $p < .05$, ** $p < .01$

Testing the Predicted Model

Incomplete data were removed before computing the path analysis in accordance with the requirements set by AMOS. The following hypothesised paths were tested, as shown conceptually in Figure 1: (1) Internet addiction, fear of missing out, and self-control predict smartphone addiction (2) smartphone addiction predicts phubbing behaviour (3) phubbing behaviour predicts the experience of being phubbed, and (4) phubbing behaviour and experience of being phubbed predict descriptive and injunctive norms of phubbing.

As seen in Figure 2 and Table 4, being phubbed significantly predicted the perceived social norms of phubbing (β = .15, p = .047). Phubbing behaviour also significantly predicted and had a divergent effect on both the social norms of phubbing (β = .19, p = .011) and being phubbed (β = .58, p < .001).

It was found that smartphone addiction significantly predicted phubbing behaviour (β = .45, p < .001). Moreover, when the effect on smartphone addiction from each variable was calculated, it was revealed that Internet addiction (β = .41, p < .001) and fear of missing out (β = .33, p < .001) were positive predictors of smartphone addiction, whereas self-control negatively predicted smartphone addiction (β = -.12, p = .016).

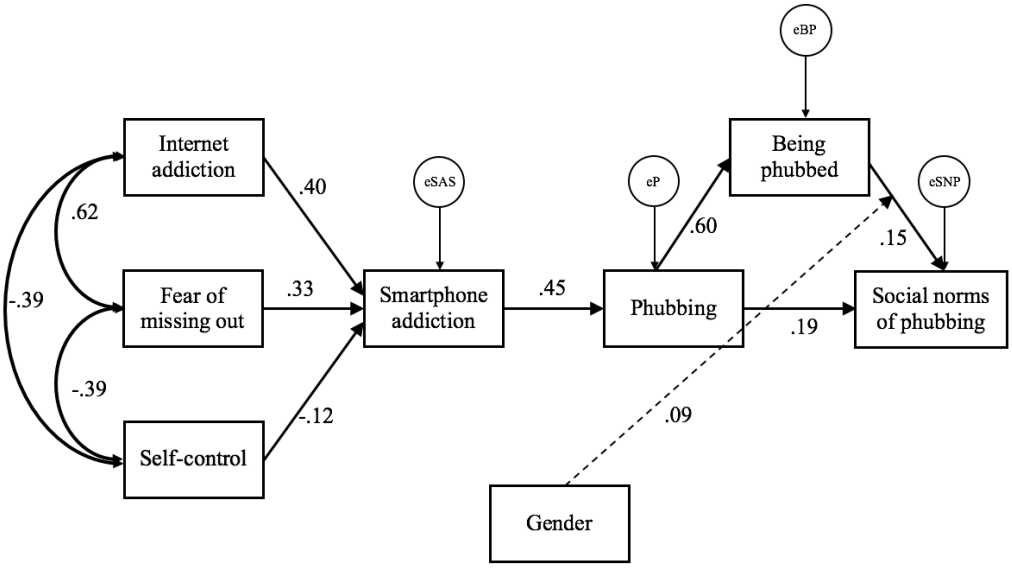

Figure 2. Phubbing model of Study 1. Standardised regression weights and covariances are shown in diagram.

Table 4

Results of Standardised Structural Path Estimates

Dependent Variable	Independent Variable	B	SE	β	t-value	p	R Square
Social norms of phubbing	Phubbing	.35	.14	.19	2.54	.012	.09
	Being phubbed	.28	.14	.15	1.98	.049	
Being phubbed	Phubbing	.58	.05	.60	11.74	.000	.36
Phubbing	Smartphone addiction	.07	.01	.45	7.90	.000	.20
Smartphone addiction	Internet addiction	.28	.04	.41	7.08	.000	.52
	Fear of missing out	.42	.07	.33	5.79	.000	
	Self-control	-.14	.06	-.12	-2.40	.017	

Note. B, unstandardised coefficients; SE, standard error; β, standardised coefficients.

Moderating Effect of Gender

Differences in frequency and duration of phubbing and being phubbed according to gender were determined by running a Mann-Whitney U test as seen in Table 5. Results indicated that the frequency of phubbing for females (mean rank = 142.03) was significantly higher than for males (mean rank = 98.76), U = 9880.00, z = 4.73, p < .001. The result also showed that the duration of phubbing was significantly greater for females (mean rank = 137.67) than for males (mean rank = 106.17), U = 9191.50, z = 3.86, p < .001.

Table 5

Non-parametric Test of the Gender Difference in Scores of Phubbing and Being Phubbed

	Male (n = 93)		Female (n = 158)		Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
	Mdn	Mean Rank	Mdn	Mean Rank				
Phubbing frequency	2.00	98.76	3.00	142.03	9880.00	22441.00	4.73	< .001
Phubbing duration	1.00	106.17	1.00	137.67	9191.50	21752.50	3.86	< .001
Phubbing sum score	3.00	95.98	4.00	143.67	10138.50	22699.50	5.14	< .001
Being phubbed frequency	2.00	97.67	3.00	142.68	9982.00	22543.00	4.91	< .001
Duration of being phubbed	1.00	108.22	2.00	136.47	9000.50	21561.50	3.33	.001
Sum score of being phubbed	3.00	98.14	5.00	142.40	9938.00	22499.00	4.75	< .001

A Mann-Whitney U test was also run to determine if there were differences in frequency and duration of being phubbed according to gender. Frequency of being phubbed for females (mean rank = 142.68) was significantly greater than for males (mean rank = 97.67), $U = 9982.00$, $z = 4.91$, $p < .001$. The results also indicated that the duration of phubbing was significant higher for females (mean rank = 136.47) than for males (mean rank = 108.22), $U = 11043.00$, $z = 3.629$, $p = .001$. In conclusion, the results revealed that women (mean rank = 143.67) phubbed their companions more than men (mean rank = 95.98; ($U = 10138.50$, $z = 5.14$, $p < .001$), and women (mean rank = 142.40) were phubbed by their companions more than men (mean rank = 98.14) ($U = 9938.00$, $z = 4.75$, $p < .001$). Furthermore, a Mann-Whitney U test was run to determine if there were differences in the IAT score, SAS-SV score, and FoMOs score, which were not normally distributed for both males and females, as assessed by Shapiro-Wilk's test ($p < .05$). Meanwhile, regarding a normally distributed BSCS score, an independent sample t-test was run to assess the BSCS score. The SAS-SV score for females (mean rank = 137.67) was significantly higher than for males (mean rank = 106.18), $U = 9190.50$, $z = 3.21$, $p = .001$, as seen in Table 6.1. In contrast, the BSCS score, computed with independent sample t-test as in Table 6.2, was greater in male ($M = 42.77$, $SD = 8.51$) than in female participants ($M = 39.13$, $SD = 7.77$), $M = 3.65$, 95% CI [1.58, 5.72], $t(249) = 3.47$, $p = .001$. A Mann-Whitney U test showed no significant difference between gender and IAT score and FoMOs score in our study.

Table 6.1

Comparison of Psychometric Measurements (IAT, SAS-SV, and FoMOs) Between Genders

	Male (n = 93)		Female (n = 158)		Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
	Mdn	Mean Rank	Mdn	Mean Rank				
Internet addiction IAT score	31.00	121.92	33.00	128.40	7726.00	20287.00	.68	.495
Smartphone addiction SAS-SV score	24.00	106.18	29.00	137.67	9190.50	21751.50	3.32	.001
Fear of missing out FoMOs score	20.00	118.43	21.00	130.46	8051.00	20612.00	1.27	.205

Table 6.2

Comparison of Psychometric Measurement (BSCS) Between Genders

	Male (n = 93)		Female (n = 158)		Independent sample t-test	df	Sig. (2-tailed)
	Mean	SD	Mean	SD			
Self-control BSCS score	42.77	8.51	39.13	7.78	t = -3.47	249	.001

As we found significant gender differences among many variables, we checked the model fit for both men and women before conducting multi-group analysis in AMOS. Our proposed model had acceptable goodness-of-fit for both male participants ($\chi^2(93) = 6.87$, $p = .810$, CFI = 1.00, RMSEA = .00) and female participants ($\chi^2(158) = 19.54$, $p = .052$, CFI = .98, RMSEA = .07). We compared an original unconstrained model to alternative constrained models, which imposed a gender equality constraint of each path in the model.

Standardised estimates, constrained χ^2, $\Delta\chi^2$, and its p-value in the nested model were explored to compare gender effects in each path of the model.

Due to the significant chi-square difference ($\Delta\chi^2_{(1)} = 6.38$, $p < .05$) as seen in Table 7, gender had a moderating effect on the relationship between being phubbed and the social norms of phubbing, which was stronger in men ($\gamma = .36$, $p < .01$) compared to the same relationship in women ($\gamma = .00$, $p > .05$). As such, a hierarchical multiple regression was run to confirm the increase in variation. Gender moderated only the effect of being phubbed on perceived social norms of phubbing, as evidenced by a statistically significant increase in total variation explained of 2.4%, $F(1, 245) = 6.568$, $p < .05$ and the coefficient of the interaction term ($b = 0.753$, $SE = 0.294$) which was statistically significant ($p < .05$). We also went on to compare and found no significant moderating role of gender on the path between internet addiction and smartphone addiction, fear of missing our and smartphone addiction, self-control and smartphone addiction, smartphone addiction and phubbing, phubbing and being phubbed, and phubbing and social norms of phubbing.

Table 7

Comparison of Gender Differences in the Paths of Model

	Standardised estimates		Subgroup comparison (unconstrained $\chi^2_{(22)}$ = 26.39)		Results
	Male (n = 93)	Female (n = 158)	Constrained $\chi^2_{(23)}$	$\Delta\chi^2_{(1)}$	
Internet addiction → Smartphone addiction	.41***	.44***	26.41	.02	NS
Fear of missing out → Smartphone addiction	.34***	.32***	27.00	.61	NS
Self-control → Smartphone addiction	-.06	-.10	26.63	.24	NS
Smartphone addiction → Phubbing	.36***	.44***	28.76	2.37	NS
Phubbing → Being phubbed	.53***	.57***	26.50	.11	NS
Phubbing → Social norms of phubbing	-.01	.30**	29.41	3.02	NS
Being Phubbed → Social norms of phubbing	.36**	.00	32.77	6.38*	M > F

Note. M = Males, F= Females, NS = not significant.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

In conclusion, the hypothesis suggesting that gender has a moderating effect was confirmed, but only for the relationship between being phubbed and the extent to which phubbing feels like normative behaviour for people (see Figure 2). Overall however, the predicted model found good support in the current data.

Discussion

To our knowledge, this study represents the first examination of both the antecedents and consequences of phubbing behaviour. We found that Internet addiction, fear of missing out, and self-control predicted smartphone addiction, which in turn predicted phubbing behaviour and the extent to which people are phubbed. Furthermore,

phubbing behaviour and the experience of being phubbed predicted the extent to which phubbing was perceived to be normative. Finally, gender moderated the effect of being phubbed on the perceived social norms of phubbing.

There are several limitations to this study that need to be considered. First, the number of participants was relatively small compared to other online surveys, and the gender ratio was not 1:1. Participants were predominately young females, and of White/Caucasian or Asian ethnic background. The unequal distribution of age, gender and ethnicity did not allow us to analyse the potential effects associated with these variables. In addition, the respondents in the current study were sampled among adults who participated for course credit, were paid on MTurk, or were acquaintances of the researchers on social networking sites. While this provided a diverse sample, it was not entirely random. Also, because all measures were self-reported, we cannot confirm the responses with the exact frequency and duration of people's phubbing experiences. Finally, because there were no established scales of general phubbing behaviour in the literature when we conducted this study, we designed the measures ourselves. Validated tools need to be created to more fully understand this phenomenon, and researchers need to pay careful attention to sampling and measurement issues in future research.

Study 1 provides valuable information about some of the factors that may predict phubbing behaviour, and what some of the effects of phubbing might be. However, research on this topic is still in its infancy and there is much still to discover. In the next chapter, we aim to complete another piece of the puzzle. Another important extension of this work would be to investigate the real-life effects of phubbing behaviour on the quality of social interactions. Extending on the survey research of Roberts and David (2016),

experimental work could shed light on the effects of different degrees of phubbing on factors such as relationship satisfaction and feelings of social inclusion. Therefore, we explore this issue further in the next chapter to get a better understanding of the psychological impact that phubbing has on human communication.

Chapter 3: Effects of Phubbing on Social Interaction

Abstract

Chapter 3 presents Study 2, which experimentally investigated the social consequences of phubbing. Participants viewed a three-minute animation in which they imagined themselves as part of a dyadic conversation. Their communication partner either phubbed them extensively, partially, or not at all. Results revealed that increased phubbing significantly and negatively affected perceived communication quality and relationship satisfaction. These effects were mediated by reduced feelings of belonging and both positive and negative affect. This research underlines the importance of phubbing as a modern social phenomenon to be further investigated.

Study 2 appears in: Chotpitayasunondh, V., & Douglas, K. M. (2018). The effects of "phubbing" on social interaction. *Journal of Applied Social Psychology*, *48*(6), 304-316.

In Chapter 2, we examined the factors related to phubbing behaviour. The most important predictor appears to be smartphone addiction (Chotpitayasunondh & Douglas, 2016; Karadağ et al., 2015). More distal predictors such as Internet addiction, fear of missing out, and lack of self-control have been found to predict smartphone addiction, which in turn predicts phubbing behaviour. Also, Study 1 demonstrated that phubbing behaviour itself predicts the extent to which people are phubbed, so that being a phubber can result in a vicious, self-reinforcing cycle of phubbing that makes the behaviour become normative. As phubbing becomes increasingly affects human interaction and psychological wellbeing, it is crucial to gather more information in order to understand the mechanisms underlying the effects of phubbing. In Chapter 3, we aim at filling this gap of knowledge.

Chapter 3 proposes a negative impact of phubbing on fundamental needs and affect. According to Williams's (2009b) Need-Threat Model of ostracism, being excluded and ignored has various negative consequences, including a negative mood, and threatens fundamental human needs (belonging, self-esteem, meaningful existence, and control). Brief encounters with phubbing behaviour in conversation may cause psychological distress similar to ostracism (David & Roberts, 2017) and could lead to negative interaction outcomes. In addition, we further propose that phubbing will be associated with negative perceived interaction quality and negative relationship satisfaction (e.g., Abeele et al., 2016; Ranie & Zickuhr, 2015; Roberts & David, 2016). However, we more specifically propose to test the hypothesis that phubbing indirectly influences perceived interaction quality and relationship satisfaction, because it threatens people's fundamental needs to belong, have control, have high self-esteem and experience a meaningful existence, and it also dampens their affect. In other words, the effects of phubbing on relationship

satisfaction and perceived interaction quality should be mediated by threats to fundamental needs, and by affect. We also consider some potential moderators of these hypothesised effects. One of the possible moderators influencing the relationships between phubbing, threats to fundamental needs, affect, and perceptions of interaction outcomes is the extent to which people interpret phubbing behaviour as socially normative (Chotpitayasunondh & Douglas, 2016). If people view phubbing as normative, they may not view it as a form of social rejection, distressing, or concerning. Furthermore, people's experiences of phubbing may be moderated by their sensitivity to rejection (Kang & Chasteen, 2009). Phubbees who have lower sensitivity to rejection may better cope with the behaviour and maintain their affect and fundamental needs satisfaction more easily than highly sensitive people. We therefore included these two potential moderating factors in the current study.

Study 2

Although phubbing has attracted growing interest in recent years, research on the social consequences of phubbing is limited. Moreover, to our knowledge there is no research that investigates the mechanisms underlying the effects of phubbing, except for factors such as jealousy within romantic relationships (Krasnova et al., 2016). In this study, we aimed to explore these mechanisms in detail. We investigated (a) the effects of being phubbed on perceived interaction quality and relationship satisfaction, and (b) the extent to which phubbing functions similarly to social exclusion and these effects are mediated by threats to fundamental needs and affect. We also explored whether these effects are moderated by the perceived normativity of phubbing or by rejection sensitivity.

Participants were asked to view a three-minute animation depicting a conversation between two people. They were asked to imagine themselves as one of the people in the

animation. The behaviour of the participant's conversation partner varied in terms of their mobile phone use during the conversation: no phubbing, partial phubbing, and extensive phubbing. After viewing the video, participants responded to each of the dependent measures and potential mediating and moderating variables.

We developed a research model to explicate the mechanisms underlying the effects of phubbing. The predicted model is depicted conceptually in Figure 3. In detail, we hypothesised that:

H1: Participants who were phubbed extensively would experience a greater threat to fundamental needs (belonging, self-esteem, meaningful existence, and control), would experience greater negative affect, and would experience less positive affect, than those who were phubbed partially or were not phubbed.

H2: Participants who were phubbed extensively would perceive their social interaction to be of lower quality and would experience lower relationship satisfaction than those who were phubbed partially, or not phubbed.

H3: Threat to fundamental needs and dampened mood would mediate the effect of phubbing on relationship satisfaction and the perceived quality of communication.

H4: We tentatively hypothesised that the perceived social normativity of phubbing, and individuals' rejection sensitivity, would moderate the effect of phubbing on fundamental human needs and affect.

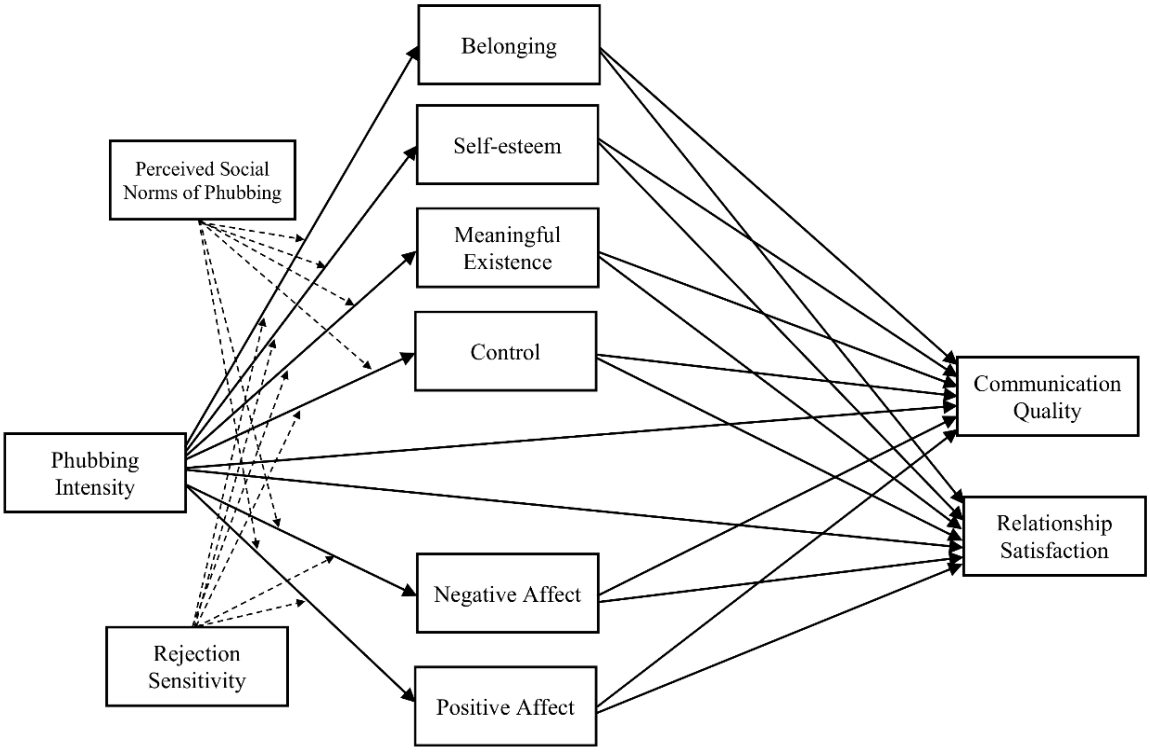

Figure 3. Proposed model of the effects of being phubbed on the communication quality and relationship satisfaction

Method

Participants

One hundred and fifty-three participants (19 men and 134 women) ranging in age from 18 to 36 years of age (M = 19.72, SD = 2.23) were undergraduate students at a British university who participated for course credit. Twenty-five participants (16.34%) who failed to answer attention check questions correctly were excluded (six from the control group, six from the partial phubbing group, and 13 from the extensive phubbing group; see explanation in the next section). In total, 128 participants (14 men and 114 women) ranging in age from 18 to 34 (M = 19.62, SD = 1.79) remained in the study (45 from the

control group, 45 from the partial phubbing group, and 38 from the extensive phubbing group). The demographics of the sample are presented in Table 8.

Table 8

General Characteristics of Participants by Gender

Characteristics	Male (n=14) % (n)	Female (n=114) % (n)	Total (n=128) % (n)
Age (years)			
Mean ± SD	19.50 ± 1.29	19.63 ± 1.85	19.62 ± 1.79
Occupation			
Attending University Full-time	100.00 (14)	87.72 (100)	89.06 (114)
Attending University and Working Part-time	0.00 (0)	12.28 (14)	10.94 (14)
Ethnicity			
White/Caucasian	57.14 (8)	62.28 (71)	61.72 (79)
Black British Caribbean	0.00 (0)	2.63 (3)	2.34 (3)
Black British African	14.29 (2)	5.26 (6)	6.25 (8)
Other Black background	0.00 (0)	2.63 (3)	2.34 (3)
Asian British Indian	7.14 (1)	2.63 (3)	3.13 (4)
Asian British Pakistani	0.00 (0)	2.63 (3)	2.34 (3)
Asian British Bangladeshi	0.00 (0)	0.88 (1)	1.59 (1)
Chinese	0.00 (0)	1.75 (2)	0.78 (2)
Other Asian background	14.29 (2)	7.02 (8)	7.81 (10)
Other (including mixed ethnicity)	7.14 (1)	12.28 (14)	11.72 (15)

Manipulation

Participants watched a three-minute silent animation that depicted two people having a conversation. They were asked to watch the animation carefully and imagine themselves as the person closest to the screen (i.e., the person with the back to the screen). Then they were instructed to imagine, as vividly as they could, that they were this person and that they were engaged in this conversation with the other person. The characters of the participant and conversation partner were designed to be neutral in gender and ethnicity, which were thought to be possible confounding factors in this study. Voice was also

removed from the animation, so the effect of being phubbed could not be influenced by the content of the conversation. However, the characters moved their mouths when they were talking so that the conversation looked like both people were speaking in turn, as they would in a typical face-to-face interaction. Participants were randomly assigned to one of three different animation conditions: (1) the conversation partner did not phub at all, (2) they phubbed part of the time, and (3) they phubbed most of the time. In the "no phubbing" condition (control condition), the conversation partner, with a smartphone in his/her left hand, comes and sits opposite the participant. The conversation partner immediately puts the smartphone on the table and does not pick it up during the three-minute conversation. The first experimental animation created the "partial phubbing" situation, in which participants are phubbed by their conversation partner about half of the time. The first 30 seconds of the animation are similar to what can be seen in the control condition video, but then the conversation partner picks the smartphone up from the table and starts phubbing for 30 seconds. During this phubbing time, as shown in Figure 4, the conversation partner looks down at the smartphone, completely averts the gaze from the participant, swipes the screen on the device, and keeps smiling and laughing about something he/she has just read. The partial phubbing animation also repeats this sequence periodically in the second and the third minute of the conversation. The final experimental animation represents the "extensive phubbing" situation, in which the participant's conversation partner comes and sits, then immediately starts phubbing and continues this behaviour throughout their conversation.

Figure 4. Screenshot from the partial phubbing animation

Measures

Needs satisfaction. The Need-Threat Measure (NTM), developed by Jamieson et al. (2010) contains 20 items measuring the extent to which an individual feels the satisfaction/threat to the four fundamental needs following ostracism (e.g., Williams, 2009b; e.g., "I felt I belonged to the group" and "I felt powerful"; 1 = not at all, 5 = extremely; $\alpha = .90$, $M = 2.87$, $SD = 1.20$ for belonging, $\alpha = .90$, $M = 2.70$, $SD = 1.02$ for self-esteem, $\alpha = .91$, $M = 2.93$, $SD = 1.17$ for meaningful existence, and $\alpha = .77$, $M = 2.11$, $SD = .82$ for control). Items for each domain were reverse-coded as appropriate. Since the NTM was originally designed to measure needs satisfaction in the cyberball game experiment, we modified some items such as "I felt the other players interacted with me a lot" to "I felt that the conversation partner interacted with me a lot".

Positive and negative affect schedule (PANAS). This is a 20-item measure (Watson, Clark, & Tellegen, 1988) asking participants to rate how well different feeling

and emotions (e.g., “Interested”, “Distressed”, “Excited”, and “Upset”) describe them on a 5-point scale (1 = very slightly or not at all, 5 = extremely; $\alpha = .92$, $M = 18.77$, $SD = 8.03$ for Positive Affect and $\alpha = .83$, $M = 16.16$, $SD = 5.52$ for Negative Affect).

Quality of communication. The Iowa Communication Record (ICR), which assesses the quality and impact of communications within specific conversational contexts (Schwarz, 2008), is a 10-item questionnaire asking participants to read 10 bi-polar descriptors (e.g., “Attentive - Poor Listening”, “Formal - Informal”, “Smooth - Difficult”; Duck, Rutt, Hoy, & Strejc, 1991) and rate the conversation on each via a seven-point scale. Two additional descriptors (Schwarz, 2008) were used to add meaningful dimensions of communication quality that are not included in the original version of the ICR (i.e., “Enjoyable – Not Enjoyable” and “High Quality – Low Quality”; overall $\alpha = .82$, $M = 5.47$, $SD = 1.34$). Reliabilities of the scale which included the two additional items were .88 for friends and 89 for intimate and family relationship (Schwarz, 2008). In our path analysis, we reversed this score and labelled it as communication quality. This variable has not been reverse scored in other analyses of this study.

Relationship satisfaction. The Relationship Assessment Scale (RAS; Hendrick, 1988) was developed to measure general satisfaction with romantic relationships, and consisted of seven items that were modified here to measure satisfaction with the animated conversation (e.g., “In general, how satisfied were you with the conversation?” Participants responded on a five-point scale (1 = low satisfaction, 5 = high satisfaction; $\alpha = .94$, $M = 2.58$, $SD = 1.04$).

Perceived social norms of phubbing. The Perceived Social Norms of Phubbing Scale (PSNP; Chotpitayasunondh & Douglas, 2016) contains three items measuring

descriptive norms, which are based on observations of others' behaviour such as "Do you think that phubbing behaviour is typical among people around you?", and two items measuring injunctive norms, which are related to the inference of others' approval of phubbing such as "Do you think that other people view phubbing behaviour as appropriate?" using a five-point scale (1 = not at all, 5 = very much; $\alpha = .44$, $M = 16.12$, $SD = 2.63$). Both norms' measurements were combined to a general measure of perceived social norms of phubbing, which was proposed as a moderator.

Rejection sensitivity. The Adult Rejection Sensitivity Questionnaire *(*A-RSQ), is a modification of the original RSQ (Downey & Feldman, 1996). Participants rated the extent to which 18 statements accurately describe them on a six-point scale (e.g., "How concerned or anxious would you be over whether or not your family would want to help you?" and "I would expect that they would agree to help me as much as they can", 1 = very unconcerned/very unlikely, 6 = very concerned/very likely), and coding allows for a score between 1 and 36; $\alpha = .70$, $M = 9.15$, $SD = 2.55$). Rejection sensitivity was also proposed as a moderator in this study.

Procedure

After giving their informed consent, participants were placed in individual cubicles, each with a personal computer, and asked to complete an online questionnaire designed via Qualtrics software. The study was a three-group (phubbing: none/partial/extensive) between-participants experimental design. The dependent measures were perceived communication quality and relationship satisfaction. Fundamental needs threat (belonging, self-esteem, meaningful existence, and control) and affect (negative and positive), were

included in the model as potential mediators, and perceived social norms of phubbing and rejection sensitivity were included as potential moderators (see Figure 3).

Participants first completed the Adult Rejection Sensitivity Questionnaire. They then viewed the phubbing manipulation animation. Next, participants were asked to answer two questions about what they saw in the video in order to serve as attention check. For this we asked the participants to indicate the colour of the conversation partner's shirt (the correct answer was white), and the name of the object on the table (the correct answer was a bottle). Next, participants were asked to complete the Iowa Communication Record, the Relationship Assessment Scale, the Need-Threat Measure, the PANAS, and the Perceived Social Norms of Phubbing Scale, respectively. Finally, participants completed some basic demographic data. At the conclusion of the study, they were thanked and debriefed.

Results

Correlational Analyses

All statistical tests were performed using SPSS Statistics version 24.0. In order to test interaction effects of the moderators, we created interaction products from centred A-RSQ and centred PSNP variables. Spearman's rank-order correlations were computed to assess the non-parametric relationship between phubbing intensity and dependent variables, and Pearson product-moment correlations were used to assess the relationship among other variables. All correlations between the phubbing conditions and other variables, with the exception of both proposed moderators, were statistically significant in the expected directions. Intensity of being phubbed in dyadic conversation negatively correlated with RAS, positive affect, and all NTM subscales, whereas intensity of being phubbed positively

correlated with ICR and negative affect, as shown in Table 9. Neither of the proposed moderators correlated with the dependent measures or potential mediators.

Table 9

Descriptive Statistics and Correlation Coefficients Among Study Variables

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Phubbing intensity	--	--	--												
2. Belonging (NTM)	2.87	1.20	-.74*	(.90)											
3. Self-esteem (NTM)	2.70	1.02	-.62*	.80*	(.90)										
4. Meaningful existence (NTM)	2.93	1.17	-.68*	.85*	.83*	(.91)									
5. Control (NTM)	2.11	.82	-.39*	.63*	.70*	.68*	(.77)								
6. PANAS negative	16.16	5.52	.44*	-.62*	-.60*	-.60*	-.45*	(.83)							
7. PANAS positive	18.77	8.03	-.53*	.61*	.70*	.68*	.65*	-.30*	(.92)						
8. ICR	5.47	1.34	.71*	-.84*	-.74*	-.78*	-.58*	.60*	-.55*	(.82)					
9. RAS	2.58	1.04	-.72*	.87*	.80*	.83*	.68*	-.54*	.73*	-.85*	(.94)				
10. A-RSQ	9.15	2.55	.06	-.03	-.17	-.10	-.16	.11	-.07	.06	-.11	(.62)			
11. PSNP	16.12	2.63	-.14	.07	.08	.03	-.02	.04	.12	-.04	.06	-.09	(.44)		

Note. NTM: Need-Threat Measure; ICR: Iowa Communication Record; RAS: Relationship Assessment Scale; PANAS: Positive and Negative Affect Schedule;
A-RSQ: Adult Rejection Sensitivity Questionnaire; PSNP: Perceived Social Norms of Phubbing.
* $p < .001$.
Cronbach's alphas are shown in the diagonal.

Proposed Moderators

We then explored the potential moderating effects of rejection sensitivity and perceived social norms of phubbing on the relationship between phubbing intensity and fundamental needs, negative affect, and positive affect, as seen in Figure 3. We used Hayes and Preacher's (2013) PROCESS procedure for SPSS (model 9, 20,000 resamples, bias corrected). The result showed no moderating effects of rejection sensitivity and perceived

social norms of phubbing in our path model. The results revealed no significant relationships between the phubbing intensity * A-RSQ interaction term and fundamental needs; belonging ($p = .96$), self-esteem ($p = .86$), meaningful existence ($p = .72$), and control ($p = .32$). No significant relationship was found between this interaction term and both PANAS scores; negative ($p = .52$) and positive ($p = .07$). The results also showed no significant relationships between the phubbing intensity * PSNP interaction term and fundamental needs; belonging ($p = .71$), self-esteem ($p = .27$), meaningful existence ($p = .97$), and control ($p = .44$). Moreover, no significant relationship was found between this interaction term and both PANAS scores; negative ($p = .96$) and positive ($p = .54$). Due to this and the low reliability of the PSNP, both moderators were therefore omitted from our path model.

Effects of Phubbing on Communication Outcomes

A one-way multivariate analysis of variance (MANOVA) was conducted to determine the effects of being phubbed on the combined dependent variables. There were linear relationships, as assessed by scatterplot, and no multicollinearity ($r = -.85 - .87$, $p < .001$). Tabachnick and Fidell (2013) suggest that no correlation should be above $r = +/-.90$. There was homogeneity of variance-covariances matrices, as assessed by Box's test of equality of covariance matrices ($p < .001$). The difference between conditions on the combined dependent variables was significant, $F(16, 236) = 9.91$, $p < .001$; Wilks' $\Lambda = .36$; partial $\eta^2 = .40$.

The mean difference between groups of participants on the dependent variables is presented in Table 10. Follow-up univariate ANOVAs showed that ICR scores ($F(2, 125) = 66.89$, $p < .001$; partial $\eta^2 = .52$) and RAS scores ($F(2, 125) = 68.95$, $p < .001$; partial η^2

= .53) were significantly different across the different phubbing conditions, using a Bonferroni-adjusted α level of .025. These were both medium-sized effects.

Table 10

Means and Standard Deviations of Measures by Groups of Participants

Measures	No Phubbing (n=45)		Partial Phubbing (n=45)		Extensive Phubbing (n=38)	
	M	SD	M	SD	M	SD
Iowa Communication Record	4.26	1.07	5.71	.90	6.62	.82
Relationship Assessment Scale	3.52	.85	2.40	.76	1.68	.47
Need-Threat Measure						
Belonging	4.01	.83	2.62	.88	1.82	.65
Self-esteem	3.52	.92	2.52	.78	1.96	.65
Meaningful existence	3.95	.80	2.70	.88	1.99	.87
Control	2.58	.89	1.96	.72	1.75	.57
Positive and Negative Affect Schedule						
Negative	13.42	4.27	17.04	6.25	18.37	4.63
Positive	23.78	8.51	17.62	6.81	14.18	5.17

We investigated further with post hoc tests to pinpoint the exact differences between the conditions. The Tukey post hoc test was used to compare all possible combinations of group differences when the assumption of homogeneity of variances was met, as assessed by Levene's Test of Homogeneity of Variance ($p > .05$). The Games-Howell post hoc test was used when the assumption of homogeneity of variances was violated. As predicted, participants in the control group showed significantly higher RAS than participants who either were phubbed part of the time or most of the time. Meanwhile, control group participants showed significantly lower ICR mean scores than participants in either the partial phubbing or extensive phubbing groups. Post hoc test results of the dependent

variables are shown in Table 11. Cohen's d values ranging between 1.09-2.69 represented large effects.

Table 11

Post Hoc Tests of ICR and RAS

Dependent variable	Post hoc test	(I)Phubbing condition	(J)Phubbing condition	Mean diff	Std. error	Sig.	95% CI Upper	95% CI Lower	Cohen's d
ICR	Tukey HSD	No phubbing	Partial phubbing	-1.45	.20	<.001	-1.92	-.98	1.47
			Extensive phubbing	-2.36	.21	<.001	-2.85	-1.86	2.47
		Partial phubbing	No phubbing	1.45	.20	<.001	.98	1.92	1.47
			Extensive phubbing	-.91	.21	<.001	-1.40	-.42	1.09
		Extensive phubbing	No phubbing	2.36	.21	<.001	1.86	2.85	2.47
			Partial phubbing	.91	.21	<.001	.42	1.40	1.09
RAS	Games-Howell	No phubbing	Partial phubbing	1.12	.17	<.001	.71	1.53	1.39
			Extensive phubbing	1.85	.15	<.001	1.49	2.20	2.69
		Partial phubbing	No phubbing	-1.12	.17	<.001	-1.53	-.71	1.39
			Extensive phubbing	.73	.14	<.001	.40	1.05	1.15
		Extensive phubbing	No phubbing	-1.85	.15	<.001	-2.20	-1.49	2.69
			Partial phubbing	-.73	.14	<.001	-1.05	-.40	1.15

Effects of Phubbing on Fundamental Needs as Potential Mediators

The mean difference between groups on the proposed mediators can be seen in Table 10. Using a Bonferroni-adjusted α level of .025, follow-up univariate ANOVAs showed that all domains of need satisfaction following ostracism: belonging ($F(2, 125) = 80.75$, $p < .001$; partial $\eta^2 = .56$), self-esteem ($F(2, 125) = 41.17$, $p < .001$; partial $\eta^2 = .40$), meaningful existence ($F(2, 125) = 57.13$, $p < .001$; partial $\eta^2 = .48$), and control ($F(2, 125) = 14.26$, $p < .001$; partial $\eta^2 = .19$) were significantly different across the different phubbing conditions. The partial η^2 values ranging between .19- .56 revealed small to medium effects.

We also used post hoc tests to determine where the differences lay between conditions. As predicted, participants in the no phubbing group showed significantly higher overall needs satisfaction – also in each separate domain – than participants who either were phubbed part of the time or most of the time. Post hoc test results of the mediating variables are shown in Table 12. Post hoc tests revealed a non-significant difference between the partial and extensive phubbing groups in the need to control ($p = .30$). The other group differences showed significant differences with medium and large effects (Cohen's d ranging between .76 – 2.93).

Table 12

Post Hoc Tests of All Need-Threat Measure Domains

Dependent variable	Post hoc test	(I)Phubbing condition	(J)Phubbing condition	Mean diff	Std. error	Sig.	95% CI		Cohen's d
							Upper	Lower	
Belonging	Games-Howell	No phubbing	Partial phubbing	1.39	.17	<.001	.99	1.79	1.62
			Extensive phubbing	2.19	.18	<.001	1.77	2.61	2.93
		Partial phubbing	No phubbing	-1.39	.17	<.001	-1.79	-.99	1.62
			Extensive phubbing	.80	.18	<.001	.38	1.22	1.04
		Extensive phubbing	No phubbing	-2.19	.18	<.001	-2.61	-1.77	2.93
			Partial phubbing	-.80	.18	<.001	-1.22	-.38	1.04
Self-esteem	Tukey HSD	No phubbing	Partial phubbing	1.00	.17	<.001	.60	1.40	1.17
			Extensive phubbing	1.56	.18	<.001	1.14	1.97	1.96
		Partial phubbing	No phubbing	-1.00	.17	<.001	-1.40	-.60	1.17
			Extensive phubbing	.56	.18	.01	.14	.97	.78
		Extensive phubbing	No phubbing	-1.56	.18	<.001	-1.97	-1.14	1.96
			Partial phubbing	-.56	.18	.01	-97	-.14	.78
Meaningful existence	Tukey HSD	No phubbing	Partial phubbing	1.25	.18	<.001	.82	1.67	1.48
			Extensive phubbing	1.96	.19	<.001	1.51	2.40	2.34
		Partial phubbing	No phubbing	-1.25	.18	<.001	-1.67	-.82	1.48
			Extensive phubbing	.71	.19	.01	.26	1.15	.81
		Extensive phubbing	No phubbing	-1.96	.19	<.001	-2.40	-1.51	2.34
			Partial phubbing	-.71	.19	.01	-1.15	-.26	.81
Control	Games-Howell	No phubbing	Partial phubbing	.62	.17	.001	.21	1.02	.76
			Extensive phubbing	.83	.16	<.001	.44	1.22	1.11
		Partial phubbing	No phubbing	-.62	.17	.001	-1.02	-.21	.76
			Extensive phubbing	.21	.14	.30	-.13	.55	.33
		Extensive phubbing	No phubbing	-.83	.16	<.001	-1.22	-.44	1.11
			Partial phubbing	-.21	.14	.30	-.55	.13	.33

Effects of Phubbing on Positive and Negative Affect as Potential Mediators

The mean difference between groups on both mediators is presented in Table 10. Using a Bonferroni-adjusted α level of .025, follow-up univariate ANOVAs showed that both domains of affect: negative ($F(2, 125) = 10.52$, $p < .001$; partial $\eta^2 = .14$), and positive ($F(2, 125) = 20.00$, $p < .001$; partial $\eta^2 = .24$) were significantly different across the different phubbing conditions. Both partial η^2 values revealed small effects.

Furthermore, we used Games-Howell post hoc tests to determine where the differences lay between conditions. As predicted, participants in the no phubbing group showed significantly higher positive affect and lower negative affect than participants who were either phubbed part of the time or most of the time. Post hoc test results of the mediating variables are shown in Table 13. They revealed a non-significant difference only between the partial and extensive phubbing groups in negative affect ($p = .51$). The other group differences showed significant differences with medium and large effects (Cohen's d ranging between .60 – 1.36).

Table 13

Post Hoc Tests of PANAS

Dependent variable	Post hoc test	(I)Phubbing condition	(J)Phubbing condition	Mean diff	Std. error	Sig.	95% CI		Cohen's d
							Upper	Lower	
PANAS negative	Games-Howell	No phubbing	Partial phubbing	-3.62	1.13	.01	-6.32	-.93	.68
			Extensive phubbing	-4.95	.99	<.001	-7.30	-2.59	1.11
		Partial phubbing	No phubbing	3.62	1.13	.01	.93	6.32	.68
			Extensive phubbing	-1.32	1.20	<.001	-4.18	1.53	.24
		Extensive phubbing	No phubbing	4.95	.99	.51	2.59	7.30	1.11
			Partial phubbing	1.32	1.20	.51	-1.53	4.18	.24
PANAS positive	Games-Howell	No phubbing	Partial phubbing	6.16	1.62	.00	2.28	10.03	.80
			Extensive phubbing	9.59	1.52	<.001	5.96	13.23	1.36
		Partial phubbing	No phubbing	-6.16	1.62	.01	-10.03	-2.28	.80
			Extensive phubbing	3.44	1.32	.03	.30	6.58	.60
		Extensive phubbing	No phubbing	-9.59	1.52	<.001	-13.23	-5.96	1.36
			Partial phubbing	-3.44	1.32	.03	-6.58	-.30	.60

Path Analyses

We then tested the potential mediating effect of threats to fundamental needs on the relationship between phubbing and both communication outcomes without moderators, which were dropped at the previous stage. The new model proposed in this study assumed that a significant correlation existed between phubbing intensity, threats to four fundamental human needs (belonging, self-esteem, meaningful existence, and control), affect (negative and positive), communication quality (reversed ICR score), and relationship satisfaction. Analyses were conducted using the AMOS version 24.0 program.

Model fit was evaluated using the chi-square test of model fit (χ^2), the root mean square error of approximation (RMSEA), and the comparative fit index (CFI).

The model depicted in Figure 3 (minus the moderators), did not adequately fit the data, $\chi^2(128) = 25.89$, $p < .001$, CFI = .98, RMSEA = .44. However, the model was re-specified by modifying one path at a time on the basis of critical ratios and modification indices in order to find the most parsimonious version. A perusal of the model's critical ratios showed that the respective paths should be dropped between positive affect and communication quality (p = .82), self-esteem and relationship satisfaction (p = .60), control and communication quality (p = .52), negative affect and relationship satisfaction (p = .48), meaningful existence and relationship satisfaction (p = .37), meaningful existence and communication quality (p = .35), self-esteem and communication quality (p = .29), and control and relationship satisfaction (p = .13). An examination of the model modification indices indicated the need to add a covariance path between communication quality and relationship satisfaction. The results of structural path estimates of the proposed model and final model are presented in Table 14. The modified model's goodness-of-fit was satisfactory, $\chi^2(128) = 9.93$, $p = .27$, CFI = 1.00, RMSEA = .04. The chi-square difference between the hypothesised and final model was statistically significant ($\mathbf{\Delta}\chi^2 = 15.96$, $p < .001$). The result of the path analysis with standardised regression coefficients and statistical significance is presented in Figure 5.

Table 14

Results of Structural Path Estimates of Study Models

Dependent Variable	Independent Variable	Proposed Model				Final Model			
		B	SE	*β*	p	B	SE	*β*	p
Phubbing intensity	Belonging	-1.10	.09	-.74	<.001	-1.10	.09	-.74	<.001
	Self-esteem	-.79	.09	-.62	<.001	-.79	.09	-.62	<.001
	Meaningful existence	-.99	.09	-.68	<.001	-.99	.09	-.68	<.001
	Control	-.42	.08	-.41	<.001	-.42	.08	-.41	<.001
	Negative affect	2.51	.57	.37	<.001	2.51	.57	.37	<.001
	Positive affect	-4.84	.77	-.49	<.001	-4.84	.77	-.49	<.001
	Communication quality	-.38	.12	-.23	.00	-.39	.12	-.24	<.001
	Relationship satisfaction	-.20	.07	-.15	.01	-.18	.07	-.14	.01
Belonging	Communication quality	.45	.12	.40	<.001	.64	.09	.58	<.001
	Relationship satisfaction	.38	.07	.44	<.001	.51	.05	.59	<.001
Self-esteem	Communication quality	.13	.12	.10	.29				
	Relationship satisfaction	.04	.08	.04	.60				
Meaningful existence	Communication quality	.11	.12	.10	.35				
	Relationship satisfaction	.07	.07	.07	.38				
Control	Communication quality	.07	.11	.04	.52				
	Relationship satisfaction	.11	.07	.08	.13				
Negative affect	Communication quality	-.03	.02	-.14	.02	-.18	.07	-.14	.01
	Relationship satisfaction	-.01	.01	-.03	.48				
Positive affect	Communication quality	-.01	.01	-.02	.82				
	Relationship satisfaction	.03	.01	.25	<.001	.04	.01	.29	<.001

Note. B, unstandardised coefficients; SE, standard error; *β*, standardised coefficients.

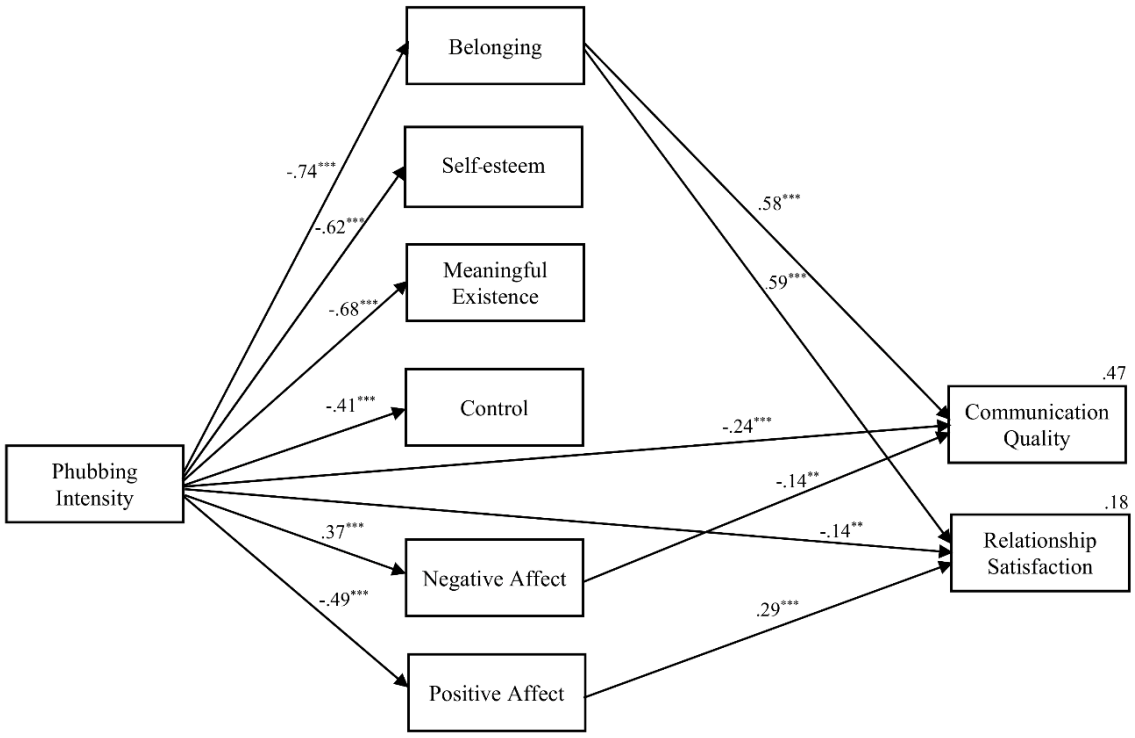

Figure 5. Path analysis of the final model * p < .05, ** p < .01, *** p < .001

As seen in Table 14 and Figure 5, results from the path analysis provided support for H1, which posited significant negative relationships between phubbing intensity and four fundamental needs satisfaction, belonging (β = -.74, p < .001), self-esteem (β = -.62, p < .001), meaningful existence (β = -.68, p < .001), and control (β = -.41, p < .001) and affect, both negative (β = .37, p < .001) and positive (β = -.49, p < .001). H2, which predicted that participants who were phubbed extensively would perceive their communication to be of lower quality (β = -.24, p < .001) and would experience lower relationship satisfaction (β = -.14, p = .01), was supported. H3 was partially supported. All paths from self-esteem needs, meaningful existence needs, and needs to control, along with one path from negative affect and one from positive affect were dropped following a model-trimming process. However, the results revealed that depletion of needs of

belongingness mediates the effect of phubbing on the perceived quality of communication (β = .58, p < .001) and relationship satisfaction (β = .59, p < .001), increase of negative affect mediates the effect of phubbing on the perceived quality of communication (β = -.14, p = .01), and depletion of positive affect mediates the effect of phubbing on relationship satisfaction (β = .29, p < .001). Furthermore, this integrated model accounts for 47% of the variance in communication quality and for 18% of the variance in relationship satisfaction.

Discussion

The present study was conducted to further understand the effects of phubbing on social interaction. As expected, our findings revealed that the experience of phubbing in a controlled dyadic conversation had a negative impact on perceived communication quality and relationship satisfaction. Theoretically, we proposed that these effects would occur because phubbing lowers mood and threatens the four fundamental needs of belongingness, self-esteem, meaningful existence, and control. We also found some support for this idea, that people who had been phubbed experienced greater threats to these needs, and one case where this threat mediated the effect of phubbing on communication outcomes. The need for belongingness particularly mediated the effect of phubbing on perceived communication quality and relationship satisfaction. However, the need for meaningful existence, self-esteem, and control did not mediate any of these effects. Furthermore, negative affect mediated the effect of phubbing on perceived communication quality and positive affect mediated the effect of phubbing on relationship satisfaction. Therefore, phubbing may often have a negative effect on important social outcomes, because it threatens the same needs and affect as when people are socially excluded. Concerns about

the negative influence of smartphone use during conversations therefore appears to be warranted (e.g., Chotpitayasunondh & Douglas, 2016).

The measures in this study present some other issues that need to be considered. First, the proposed moderators (i.e., perceived social norms of phubbing and rejection sensitivity) had no impact on any of the effects we observed. Perhaps this can be explained by the nature of people's instant responses to ostracism. Individuals have immediate indiscriminate reflexive reactions to social exclusion, then cope and recover during a later reflective stage (Williams, 2009a). Immediate responses to ostracism are robust and appear insensitive to moderation by individual differences and situational factors (Williams, 2009b). A further consideration is that meaningful existence predicted neither perceived communication quality nor relationship satisfaction. Moreover, the need to control only predicted relationship satisfaction. We can only speculate about the reasons for these non-significant effects. The relatively low reliability of the perceived social norms of the phubbing scale should also be addressed in future research.

A further limitation of this study is that the sample size was relatively small, moreover approximately one-sixth of participants failed attention check questions and were excluded from the analyses. The remaining participants, who are predominately White/Caucasian young females, were sampled among undergraduate students who participated for course credit. The unequal distribution of ethnicity and gender did not allow us to adequately analyse the potential effects associated with these variables. Second, it is possible that the mere presence of smartphones in all animations can interfere with relationship outcomes (Misra et al., 2014). Although we feel that this is unlikely and mobile phones were present across all conditions, future studies may investigate how the

presence or absence of mobile phones influences the fundamental needs and communication outcomes measured here. Finally, the current study only varied the extent to which participants were phubbed during the dyadic conversation, not the number of times participants were phubbed. The frequency of being phubbed may have an impact on relationship outcomes.

Extending Chapter 3, research should also examine phubbing effects in different relationships contexts. In particular, research could explore the effects of phubbing by different individuals (e.g., friends/enemies) and groups (ingroups/outgroups). Gonsalkorale and Williams (2007) found that being ostracised even by a despised outgroup lowers mood and has a negative impact on fundamental needs. In Chapter 4, we examine if similar effects occur for phubbing: is it worse to be phubbed by a friend than by an enemy? Research such as this would allow scholars to further align phubbing with ostracism literature and investigate possible differences between phubbing and other forms of social exclusion.

Chapter 4: The Role of Relationship Status

Abstract

The current study experimentally examined whether the consequences of phubbing depend on the social relationship between the 'phubber' and 'phubbee'. In Study 3, participants were asked to imagine themselves as part of a conversation between two people in which a mobile phone was present. Participants were randomly assigned to a 3 (relationship: best friend, casual acquaintance, worst enemy) x 2 (phubbing: presence vs absence of phubbing) between-subjects design. Results revealed that being phubbed by a worst enemy was no more or less aversive than being phubbed by a best friend or a casual acquaintance. We removed the acquaintance condition in Study 4, and again found that being phubbed by a worst enemy had similar effects on basic human needs, affect, and interaction outcomes as being phubbed by a best friend. This research suggests that the effects of phubbing may not depend on the relationship between the phubber and phubbee.

In Chapter 3, we demonstrate the negative effects on perceived communication quality and relationship satisfaction that resulted from the experience of phubbing in a controlled dyadic conversation. Phubbing is considered a specific form of social ostracism that dampens people's mood and threatens their fundamental human needs, including the sense of belonging, self-esteem, meaningful existence, and control. The previous chapter also revealed the mechanisms underlying the effects of phubbing on social interactions. The need for belonging mediated the effect of phubbing on interaction outcomes. In addition, negative affect mediated the effect of phubbing on perceived communication quality and positive affect mediated the effect of phubbing on relationship satisfaction.

Other studies also showed that the experience of being phubbed is similar to being ostracised. Hales, Dvir, Wesselmann, Kruger, and Finkenauer (2018) found that phubbees reported greater feelings of ostracism, not only during the event, but also when recalling the event. Phubbing also affected participants' fundamental human needs both in casual and serious types of conversation, however the effect was not greater in the context of serious conversations. As a form of ostracism, phubbing appears to ruin the impression that other people form of the phubber, which in turn damages the phubber's chances of developing a relationship with the conversation partner (Abeele et al., 2016). Phubbing therefore, like other forms of ostracism, affects basic human needs and leads to negative consequences, both for individuals and social interactions.

Today there is growing awareness and acknowledgement of the effects of phubbing. However, the effects of phubbing in different relationship contexts have not been investigated to date. Although we know that phubbing has many negative consequences, it is not clear whether the identity of the phubber can alleviate or aggravate those

consequences. On the basis of existing theory and research, Chapter 4 focuses primarily on the idea that phubbing, as a specific form of ostracism, will be unpleasant in any kind of dyadic conversation. Phubbing violates fundamental human needs, affect, communication quality, and relationship satisfaction. It is less clear, however, how relationship status will affect responses to phubbing. Based on literature, we tentatively predict that reflexive reactions to phubbing will vary, depending on the phubber. More specifically, we propose that phubbing by friends may be experienced as more detrimental than by casual acquaintances or enemies. We examined this possibility in two experiments. In the first experiment of this chapter (Study 3), participants were asked to view an animation of two people having a conversation, and to imagine themselves as part of the interaction. In this interaction, participants were either phubbed by a friend, casual acquaintance, or enemy, and were asked to rate their fundamental needs, affect, and also relationship satisfaction and communication quality. We conducted a second experiment (Study 4) with only the friend and enemy conditions. We hypothesised that the effect of phubbing on (a) fundamental needs (belonging, self-esteem, meaningful existence, and control), and (b) positive and negative affect would be more negative for participants who were phubbed by a person they liked than by someone they disliked. We also predicted that the effect of phubbing on (a) communication quality, and (b) relationship satisfaction would be more negative for participants who were phubbed by a person they liked than by someone they disliked.

Study 3

The aim of this study was to investigate people's psychological reactions to phubbing, depending on the source of the phubbing (friend, enemy or acquaintance). In

this experiment, we attempted to gauge how interpersonal relationship status influences how people judge the quality of the interaction and how they feel about the conversation partner who has ignored them.

Method

Participants

Power analysis for multiple regression was conducted in G*Power to determine a required sufficient sample size using an alpha of 0.05, a power of 0.95, and a small effect size (f = 0.05) (Faul et al., 2013). This calculation was for one predictor, i.e. phubbing. Based on the assumptions, the desired sample size was 262. Three hundred and three participants from Prolific Academic (147 men, 155 women, and one transgender) ranging in age from 18 to 64 years (M = 33.35, SD = 10.97) completed an online questionnaire. Seven participants (2.31%) who failed to answer both attention check questions correctly were excluded. In total, 296 participants (143 men, 152 women, and one transgender) ranging in age from 18 to 64 (M = 33.31, SD = 11.05) remained in the study. Participants were primarily White/Caucasian (86.15%), full-time workers (50.34%), and had college-level education (67.91%). They were paid a small sum of £0.85 for their participation.

Manipulations

Relationship status manipulation. Participants were asked to imagine themselves having a conversation with: (1) their best friend, (2) a casual acquaintance, or (3) their worst enemy. For instance, the instruction to respondents in the best friend condition was as follows:

"In the next task, we would like you to imagine that you are having a conversation with another person. Specifically, as vividly as you can, imagine that you are having a

conversation with your best friend. That is, you strongly like this person. Please now imagine yourself having this conversation with your best friend. Once you have done so, please move onto the next page."

The task instruction presented above in italics was modified to "imagine that you are having a conversation with a casual acquaintance. That is, you neither strongly like nor strongly dislike this person" for a casual acquaintance, and to "imagine that you are having a conversation with your worst enemy. That is, you strongly dislike this person" for a worst enemy.

Phubbing manipulation. The animations used were from a previous experiment investigating the effects of phubbing on social interactions (Chotpitayasunondh & Douglas, 2018). Participants were asked to watch the animation carefully and imagine themselves as the person closest to the screen (i.e., the person with the back to the screen). Participants were instructed to vividly imagine that they were engaged in interaction with the other person. The characters' interaction looked like both people were speaking in turn, as in a typical face-to-face conversation. Participants were randomly assigned to one of two different animation conditions: (1) the conversation partner did not phub at all, and (2) they phubbed part of the time. In the first animation ("no phubbing" or control condition), the conversation partner, with a smartphone in his/her left hand, came and sat opposite to the participant's character. However, the smartphone was put on the table without being used during the three-minute conversation. In the alternative animation ("partial phubbing" or experimental condition), participants were phubbed by their conversation partner for about half of the three-minute conversation. The first 30 seconds of the animation were similar to the control condition, but then the conversation partner picked up the smartphone from the

table and started phubbing for 30 seconds. During this phubbing time, as shown in Figure 4, the conversation partner looked down at the smartphone, completely averted his/her gaze from the participant, swiped the screen on the device, and kept smiling and laughing about something he/she read. The partial phubbing animation also repeated this sequence periodically in the second and the third minute of the conversation.

Measures

Manipulation check. The check for the relationship manipulation was a set of four items assessing how participants felt toward their conversation partners, and was adapted from Gonsalkorale and Williams (2007). These items were: "I agree with and share the same beliefs as this person", "I respect this person, even if I may not agree with it", "This person disgusts me", and "The world would be a better place if this person did not exist". Participants responded on a five-point scale (1 = strongly disagree, 5 = strongly agree; α = .92).

Needs satisfaction. This was a 20-item measure (Jamieson et al., 2010) asking participants to rate the extent to which they felt the satisfaction/threat to the four fundamental needs following ostracism (e.g., Williams, 2009b; e.g., "I felt rejected", "I felt good about myself", I felt invisible, and "I felt powerful"; 1 = not at all, 5 = extremely; α = .81, M = 3.08, SD = .91 for belonging, α = .83, M = 2.67, SD = .87 for self-esteem, α = .83, M = 2.95, SD = .93 for meaningful existence, α = .66, M = 2.19, SD = .70 for control, and α = .92, M = 2.72, SD = .72 for overall score). Items for each domain were reverse-coded as appropriate. Since the NTM was originally designed to measure needs satisfaction in experiments using the cyberball game (Jamieson et al., 2010), we modified some items such as "I felt that I was unable to influence the actions of the other players" to "I felt that I

was unable to influence the actions of my conversation partner". Separate needs of belonging, self-esteem, meaningful existence, and control scores were created by averaging the items in their domains with lower scores, indicating less human need satisfaction (i.e., more need-threat).

Positive and negative affect schedule. The Positive and Negative Affect Schedule (PANAS), developed by Watson et al. (1988) contains 20 items asking participants to rate how well different feelings and emotions (e.g., "Enthusiastic", "Irritable", "Nervous", and "Determined") describe them on a five-point scale (1 = very slightly or not at all, 5 = extremely; $\alpha = .91$, $M = 20.07$, $SD = 7.68$ for Positive Affect and $\alpha = .89$, $M = 16.77$, $SD = 6.84$ for Negative Affect). Separate positive and negative affect scores were created by summing the items in their domains, with higher scores indicating greater positive or negative affect respectively.

Quality of communication. The Iowa Communication Record (ICR; Schwarz, 2008), was developed to measure the quality and impact of communication within specific conversational contexts. Participants rated the extent to which 10 bi-polar descriptors (e.g., "Relaxed – Strained", "Great deal of understanding – Great deal of misunderstanding", "Free of communication breakdowns – Laden with communication breakdowns" (Duck et al., 1991)) accurately described the conversation, each on a seven-point scale. Two additional bi-polar descriptors (i.e., "Enjoyable – Not Enjoyable" and "High Quality – Low Quality" (Schwarz, 2008)) were used to add meaningful dimensions of communication quality ($\alpha = .81$, $M = 5.50$, $SD = 1.30$). Items were averaged, with higher sores indicating poorer communication quality. In our regression analyses, we reversed this score and labelled it as communication quality (ICRr).

Relationship satisfaction. The Relationship Assessment Scale (RAS; Hendrick, 1988) is a seven-item measure that assesses general satisfaction with romantic relationships. Items were adapted here to measure satisfaction with the animated conversation (e.g., "How well did your conversation partner meet your needs? and "To what extent were the problems in this conversation?" Participants responded on a five-point scale (1 = low satisfaction, 5 = high satisfaction; $\alpha = .89$, $M = 2.48$, $SD = .91$). Two items were reverse-coded as appropriate. Then items were averaged with higher scores, indicating the respondent's satisfaction with his/her relationship.

Procedure

After giving their informed consent, participants were asked to provide their demographic data. They were then randomly assigned (through the randomisation function in Qualtrics software) to a 3 (relationship status: best friend, casual acquaintance, and worst enemy) x 2 (phubbing intensity: no phubbing at all vs. partial phubbing) between-participants factorial design. The dependent measures were perceived communication quality, relationship satisfaction, fundamental needs threat (belonging, self-esteem, meaningful existence, and control), and affect (negative and positive).

Participants were then asked to complete the imaginary task, answer the manipulation check questions, then view the phubbing animation. Next, participants were asked to answer two questions about what they saw in the animation in order to serve as an attention check. More specifically, they were asked to indicate the colour of the conversation partner's shirt (the correct answer was white), and the name of the object on the table (the correct answer was a bottle). Finally, they were asked to complete the NTM,

the PANAS, the RAS, and the ICR, respectively. At the end of the study, the participants were debriefed, thanked, and paid.

Results

All statistical tests were performed using SPSS Statistics version 25.0. All means and standard errors of variables can be seen in Table 15.

Table 15

Study 3: Individual Need-Threat Measures, PANAS, ICR and RAS Means and Standard Deviations Regarding Phubbing Intensity and Relationship Status

		Variables															
Phubbing	Relationship	B		SE		ME		C		PANAS-n		PANAS-p		ICR		RAS	
Intensity	Status	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
No phubbing	Friend	3.73	.78	3.33	.72	3.47	.88	2.31	.74	14.23	6.74	24.15	7.92	4.41	1.13	3.16	.85
	Acquaintance	3.41	.90	2.91	1.00	3.15	1.08	2.07	.74	15.80	6.18	21.78	8.60	5.12	1.26	2.76	.97
	Enemy	3.19	.76	2.54	.74	2.92	.90	2.24	.70	17.30	7.21	19.21	7.35	5.31	1.15	2.42	.86
Phubbing	Friend	2.74	.85	2.52	.81	2.71	.85	2.20	.67	17.43	6.54	18.73	7.20	5.93	1.25	2.27	.84
	Acquaintance	2.79	.77	2.48	.79	2.75	.79	2.20	.72	17.62	7.91	18.79	6.14	5.89	.99	2.29	.76
	Enemy	2.64	.86	2.26	.71	2.70	.86	2.11	.75	18.18	5.76	17.80	7.15	6.31	1.11	2.03	.75

Note. B = Belonging; SE = Self-esteem; ME = Meaningful existence; C = Control

Manipulation Check

A one-way ANOVA was conducted to determine the success of the relationship manipulation. Participants were classified into three groups: friend (n = 97), casual acquaintance (n = 103), and enemy (n = 96). As expected, participants in the friend condition shared the same beliefs as their group to a significantly higher extent than in the casual acquaintance and enemy conditions, $F(2, 293) = 233.02$, $p < .001$. Participants in the friend condition respected their conversation partners significantly more than in other conditions, $F(2, 293) = 265.60$, $p < .001$. In contrast, in the enemy condition, participants

reported feeling significantly more disgusted with their imagined conversation partners, and that the world would be better without them, than in the friend condition, $F(2, 293) = 244.52$, $p < .001$ and casual acquaintance condition, $F(2, 293) = 126.85$, $p < .001$. However, there were no statistically significant differences between participants in the friend condition and casual acquaintance condition in these negative attitudes. In particular, there was an increase in disgust rating from the friend condition to the casual acquaintance condition, a mean increase of .17, 95% CI [-.14, .48], which was not statistically significant ($p = .41$). Similarly, there was non-significant mean difference of .12, 95% CI [-.22, .46], $p = .69$, between the friend and casual acquaintance conditions on the question rating the extent to which participants felt that the world would be better without their partners. Overall however the results were as expected, and the manipulation of relationship status was therefore successful. Means and standard deviations are presented in Table 16.

Table 16

Study 3: Means and Standard Deviations (in Parentheses) of Manipulation Checks Regarding Perceptions of the Three Interpersonal Relationship Types

	Interpersonal Relationship		
	Friend	Acquaintance	Enemy
I agree with and share the same beliefs as this person	4.07 (.70)	3.22 (.86)	1.61 (.84)
I respect this person, even if I may not agree with it	4.60 (.61)	3.85 (.77)	1.98 (1.02)
This person disgusts me	1.29 (.82)	1.46 (.80)	3.93 (1.15)
The world would be a better place if this person did not exist	1.30 (.83)	1.42 (.84)	3.39 (1.34)

MANOVA analysis

A two-way MANOVA was used to determine whether there were statistically significant interactions between interpersonal relationship status and the presence of phubbing behavior on each dependent variable (i.e., fundamental needs satisfaction, communication quality, relationship satisfaction, and positive and negative affect), collectively and separately. However, the interaction effect between phubbing condition and interpersonal relationship status on the combined dependent variables was not statistically significant based on the two-way MANOVA analysis, $F(16, 566) = 1.00$, $p = .45$, Wilks' $\Lambda = .95$, partial $\eta^2 = .03$. Our follow-up approach was to investigate each main effect and to determine whether there were any significant interaction effects for each dependent variable separately.

Effects of Phubbing and Relationship Status

We then tested the effects of phubbing and relationship status on fundamental needs, affect, and communication outcomes. We also tested the potential moderating effect of interpersonal relationship condition on the relationship between phubbing intensity and fundamental needs, affect, and communication outcomes based on the Phubbing Model in Figure 5. In order to explore the interaction effects between phubbing intensity and interpersonal relationship status, and further test the model outlined in Figure 5, we used Hayes and Preacher's (2013) PROCESS procedure for SPSS (models 1 and 8, 20,000 resamples, bias corrected). PROCESS is widely used for evaluating direct and indirect effects in multiple mediator models and conditional indirect effects in moderated mediation models with multiple mediators (Hayes & Preacher, 2013).

Participants who were phubbed reported greater threat to the need to belong ($b = -1.16$, $t(292) = -4.57$, $p < .001$), greater threat to self-esteem ($b = -1.03$, $t(292) = -4.17$, $p < .001$), greater threat to meaningful existence ($b = -1.00$, $t(292) = -3.59$, $p < .001$), less positive affect ($b = -7.26$, $t(292) = -3.16$, $p < .01$), and higher negative affect ($b = 4.28$, $t(292) = 2.05$, $p = .04$) than the other groups. However, there was no significant phubbing main effect on need for control ($b = -.01$, $t(292) = -.05$, $p = .96$), communication quality ($b = -.34$, $t(289) = -1.36$, $p = .17$), and relationship satisfaction ($b = -.01$, $t(289) = -.05$, $p = .96$). Although there was no significant direct effect of phubbing on communication quality ($b = -.34$, $t(289) = -1.36$, $p = .17$) and relationship satisfaction ($b = -.01$, $t(289) = -.05$, $p = .96$), the overall model effects of phubbing, via combined direct and indirect pathways, were significant on communication quality ($F(6,289) = 89.66$, $p < .001$, $R^2 = .65$) and relationship satisfaction ($F(6,289) = 123.24$, $p < .001$, $R^2 = .72$).

Participants who interacted with enemies reported more threat to the need to belong ($b = -.27$, $t(292) = -3.24$, $p < .01$), self-esteem ($b = -.39$, $t(292) = -4.79$, $p < .001$), and meaningful existence ($b = -.27$, $t(292) = -2.98$, $p < .01$), as well as less positive affect ($b = -2.47$, $t(292) = -3.25$, $p < .01$), more negative affect ($b = 1.53$, $t(292) = 2.22$, $p = .03$), and lower perceived communication quality ($b = -.21$, $t(289) = -.63$, $p = .03$) than the other groups. However, there was no significant effect of interpersonal relationship status on needs to control ($b = -.04$, $t(292) = -.52$, $p = .60$) and relationship satisfaction ($b = -.07$, $t(289) = -1.30$, $p = .20$).

Interaction Effects between Phubbing and Interpersonal Relationship Status

As predicted, there was significant interaction between phubbing intensity and relationship status on self-esteem ($b = .26$, $t(292) = 2.28$, $p = .02$) and meaningful existence

(b = .27, t(292) = 2.08, p = .04). However, contrary to predictions, there were only marginal interactions for the need to belong (b = .22, t(292) = 1.88, p = .06) and positive affect (b = 2.00, t(292) = 1.87, p = .06). Moreover, the interaction was not significant for needs to control (b = -.01, t(292) = -.11, p = .91), negative affect (b = -1.16, t(292) = -1.19, p = .23), communication quality (b = -.03, t(289) = -.23, p = .82), and relationship satisfaction (b = .04, t(289) = .52, p = .61). All regression coefficients, standard errors, and p-values can be seen in Table 17.

Table 17
Regression Coefficients (B), Standard Errors (SE), and p-values (p) for the 2x3 Between-subject Phubbing Model

	Consequence																							
	Belonging			Self-esteem			Meaningful existence			Control			PANAS-p			PANAS-n			RAS			ICRr		
Antecedent	B	SE	p	B	SE	p	B	SE	p	B	SE	p	B	SE	p	B	SE	p	B	SE	p	B	SE	p
Phubbing	-1.16	.25	<.001	-1.03	.25	<.001	-1.00	.28	<.001	-.01	.22	.96	-7.26	2.30	<.01	4.28	2.09	.04	-.01	.16	.96	-.34	.25	.17
Belonging																.			.29	.04	<.001	.27	.07	<.001
PANAS-p																			.04	.00	<.001			
PANAS-n																						-.02	.01	.01
Status	-.27	.08	<.01	-.39	.08	<.001	-.27	.09	<.01	-.04	.07	.60	-2.47	.76	<.01	1.53	.69	.03	-.07	.05	.20	-.05	.08	.53
Phubbing x Status	.22	.12	.06	.26	.12	.02	.27	.13	.04	-.01	.10	.91	2.00	1.07	.06	-1.16	.97	.23	.04	.07	.61	-.03	.11	.82
Constant	3.99	.18	<.001	3.71	.18	<.001	3.73	.20	<.001	2.28	.16	<.001	26.65	1.63	<.001	12.71	1.49	<.001	-.38	.20	.06	2.31	.32	<.001

Multiple-group Analysis

We re-examined the results by conducting a multiple-group analysis in AMOS version 25.0. All paths associated with phubbing in Figure 5 were compared between

friend, casual acquaintance, and enemy conditions. The results revealed that the chi-square differences were non-significant for belonging ($\Delta\lambda^2$ = 4.18, p = .12), control ($\Delta\lambda^2$ = 2.09, p = .35), positive affect ($\Delta\lambda^2$ = 3.55, p = .17), negative affect ($\Delta\lambda^2$ = 1.52, p = .47), communication quality ($\Delta\lambda^2$ = 3.42, p = .18), and relationship satisfaction ($\Delta\lambda^2$ = 1.49, p = .48). However, there were borderline significant chi-square differences for self-esteem ($\Delta\lambda^2$ = 6.18, p = .05) and meaningful existence ($\Delta\lambda^2$ = 4.71, p = .10). In particular, the effect of phubbing intensity in the path analysis was not stronger for friends than for enemies, except the effect of phubbing on self-esteem, which was stronger for friend (β = -.47) than for acquaintance (β = -.24) and enemy (β = -.20), and the effect of phubbing on meaningful existence, which was marginally stronger for friend (β = -.41) than for acquaintance (β = -.21) and enemy (β = -.13). All unstandardised coefficients, standard errors, standardised coefficients, significances, and chi-square and degree of freedom values for corresponding constraint relationship are presented in Table 18.

Table 18

Summary of Multiple-group Analysis of Study 3

Path	Friend			Acquaintance			Enemy			$\Delta\lambda^2$/df [a]
	B	SE	*B*	B	SE	*β*	B	SE	*β*	
Phub → Belonging	-1.00***	.17	-.52	-.62***	.16	-.35	-.55***	.17	-.32	2.09ns
Phub → Self-esteem	-.81***	.15	-.47	-.43*	.18	-.24	-.29†	.15	-.20	3.09†
Phub → Meaningful existence	-.76***	.18	-.41	-.40*	.19	-.21	-.23ns	.18	-.13	2.36†
Phub → Control	-.11ns	.14	-.08	.13ns	.14	.09	-.13ns	.14	-.10	1.04ns
Phub → PANAS-n	3.20*	1.34	.24	1.81ns	1.39	.13	.89ns	1.32	.07	.76ns
Phub → PANAS-p	-5.41***	1.53	-.34	-3.00*	1.46	-.20	-1.42ns	1.47	-.10	1.77ns
Phub → ICRr	-.50*	.20	-.18	-.21ns	.18	-.09	-.71**	.22	-.30	1.68ns
Phub → RAS	-.18ns	.13	-.10	.02ns	.11	.02	-.09ns	.13	-.06	.74ns

Note. B, unstandardised coefficients; SE, standard error; *β*, standardised coefficients.

[a] Chi-square and degree of freedom values for corresponding constraint relationship.

*** p < .001, ** p < .01, * p < .05, † p < .1, ns p > .1

Discussion

The result of Study 3 revealed that being phubbed by an enemy was, on the whole, no less distressing than being phubbed by a friend or casual acquaintance. No connection was found between conversation partners' relationship status and phubbing intensity for positive affect, negative affect, communication quality, and relationship satisfaction. The interaction effect for each of the fundamental human needs was somewhat different. In particular, being phubbed had roughly the same effect on the need for belongingness and the need for control, regardless of the interpersonal relationship status of the conversation partners, while being phubbed affected the need for self-esteem and meaningful existence more when related to friends than to acquaintances and enemies. However, we cannot be sure whether the non-significant results on relationship status and phubbing intensity reflect reality, or the failed attempt to manipulate the differences between participants' perceptions of conversation partners. For instance, the casual acquaintance condition likely obscured

some of the differences between friend/enemy. Results from the one-way ANOVA test of the manipulation check questions revealed no differences between the friend and casual acquaintance groups in terms of negative attitude toward the phubber. It is possible that participants tended to interpret the casual acquaintance in a positive manner rather than as falling between friend and enemy. It is also not clear how much someone would care about being phubbed by someone they barely know. It is more interesting to know if people are really hurt by being phubbed by a friend or enemy. We therefore dropped the casual acquaintance condition in Study 4.

Study 4

Study 3 did not provide clear evidence that interpersonal relationship status moderates the effect of phubbing on interaction outcomes. However, it is useful to seek more clarity of these interaction effects in a more clear-cut two-group design. We therefore replicated Study 3 with a 2 (relationship status: best friend vs. worst enemy) x 2 (phubbing intensity: no phubbing vs. partial phubbing) between-subject design study.

Method

Participants

Power analysis for multiple regression was conducted in G*Power to determine a required sufficient sample size using an alpha of 0.05, a power of 0.95, and a small effect size (f = 0.05) (Faul et al., 2013). This calculation was for one predictor, i.e. phubbing. Based on the assumptions, the desired sample size was 262. We collected the data from two batches of participants. The first batch was one hundred and fifty-eight undergraduate students at a British university who participated for course credit (25 men, 132 women, one transgender, and one participant did not provide any gender information) from 18 to 41

years of age (M = 19.49, SD = 2.83). Unfortunately no data from the control group were collected in this batch due to a technical error occurring during data collection. We then collected data from an additional one hundred and fifty-five participants who participated in both the control and experimental group, but the programming was weighted so that more participants took part in the control condition to balance out numbers. Participants in the second batch (25 men, 129 women, one transgender, and one participant did not provide any gender information) from 18 to 41 years of age (M = 19.80, SD = 3.07) were undergraduate students at a British university who participated for course credit. We examined the discrepancies of the demographic data between the two batches of participants by using t-tests. No significant differences between the first and the second set of phubbed participants was found on age, $t(199) = -.58$, $p = .57$, attention check score, $t(199) = -1.88$, $p = .06$, and combined manipulation check score, $t(199) = .40$, $p = .69$. Moreover, no significant differences between the phubbing group of both batches was found on the scores of belonging ($t(199) = -.99$, $p = .32$), self-esteem ($t(199) = -1.45$, $p = .15$), meaningful existence ($t(199) = -.83$, $p = .41$), control ($t(62.69) = -.80$, $p = .43$), positive affect ($t(199) = -1.28$, $p = .20$), negative affect ($t(199) = .10$, $p = .92$), and ICR score ($t(65.90) = 1.89$, $p = .06$). Only the overall scores of relationship satisfaction showed significant differences ($t(199) = -2.48$, $p = .01$) which is a point we refer back to in the general discussion of this chapter. We therefore combined the data from the two batches together.

In total, three hundred and thirteen participants (50 men, 261 women, one transgender, and without gender information) ranging in age from 18 to 41 (M = 19.64, SD = 2.95), all undergraduate students at a British university, volunteered to participate in the

study for course credit. Nine participants (2.53%) who failed to answer both attention check questions correctly were excluded. In total, 304 participants (48 men, 254 women, one transgender, and without gender information) ranging in age from 18 to 41 ($M = 19.62$, $SD = 2.98$) remained in the study. Participants were primarily White/Caucasian (61.51%).

Manipulations

Relationship status manipulation. Participants were asked to perform similar imaginary tasks to those employed in Study 3. They imagined themselves having a conversation with: (1) their best friend, and (2) their worst enemy.

Phubbing manipulation. The animations used in Study 4 were identical to those used in Study 3.

Measures

Perceptions of the conversation partner. The four-item interpersonal relationship status manipulation check (Gonsalkorale & Williams, 2007) employed in the Study 3 was used again in order to assess how participants felt toward their conversation partners ($\alpha = .90$).

Needs satisfaction, positive and negative affect schedule, quality of communication, and relationship satisfaction. The NTM, PANAS, ICR, and RAS measures were as used in Study 3. Similar to Study 3, we also reversed the ICR score and labelled it as communication quality (ICRr) for using in the regression analyses. Means, standard deviations, and internal reliabilities can be seen in Table 19.

Table 19

Means, Standard deviations, and Internal Reliabilities of Measures

Measures	*M*	*SD*	α
NTM			
Belonging	3.05	.92	.82
Self-esteem	2.62	.87	.84
Meaningful existence	3.39	1.02	.78
Control	2.15	.65	.61
Total NTM score	2.80	.73	.91
PANAS			
PANAS-p	17.00	6.68	.89
PANAS-n	17.58	6.86	.87
ICR	5.73	1.21	.76
RAS	2.30	.79	.84

Procedure

After giving their informed consent, participants completed an online questionnaire designed via Qualtrics software. The procedure was identical to Study 3, apart from the absence of the acquaintance relationship condition. At the conclusion of the study, participants were debriefed, thanked, and awarded their course credit.

Results

All statistical tests were performed using SPSS Statistics version 25.0. All means and standard errors of variables can be seen in Table 20.

Table 20

Study 4: Individual Need-Threat Measures, PANAS, ICR, and RAS Means and Standard Deviations Regarding Phubbing Intensity and Relationship Status

		Variables															
Phubbing	Relationship	B		SE		ME		C		PANAS-n		PANAS-p		ICR		RAS	
Intensity	Status	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
No phubbing	Friend	3.66	.72	3.26	.64	4.05	.89	2.38	.62	20.63	8.37	20.63	8.37	4.59	1.08	2.96	.82
	Enemy	3.43	.90	2.60	.84	3.50	1.06	2.03	.64	16.08	6.68	16.08	6.68	5.58	1.20	2.19	.67
Phubbing	Friend	2.96	.91	2.71	.87	3.43	.96	2.17	.63	17.45	6.58	17.45	6.58	5.83	1.05	2.34	.79
	Enemy	2.63	.80	2.21	.75	2.97	.93	2.05	.66	15.17	4.88	15.17	4.88	6.28	1.01	1.98	.61

Note. B = Belonging; SE = Self-esteem; ME = Meaningful existence; C = Control

Manipulation Check

A t-test was conducted to determine the success of the relationship manipulation. Participants were classified into two groups: best friend (n = 152) and worst enemy (n = 152). As expected, in the friend condition, the participants shared the same beliefs as their partner significantly more than in the enemy condition, $t(302) = 23.50$, $p < .001$. Participants in the friend condition respected their conversation partners significantly more than those in the enemy condition, $t(302) = 20.45$, $p < .001$. Participants in the enemy condition reported significantly stronger feelings of disgust in their imagined conversation partners, $t(302) = 21.19$, $p < .001$, and feeling that the world would be better without their partner, $t(302) = 13.76$, $p < .001$, than those in the friend condition. Means and standard deviations are presented in Table 21.

Table 21

Study 4: Means and Standard Deviations (in Parentheses) of Manipulation Checks Regarding Perceptions of the Two Interpersonal Relationship Types

	Interpersonal Relationship	
	Friend	Enemy
I agree with and share the same beliefs as this person	4.18 (.82)	1.74 (.99)
I respect this person, even if I may not agree with it	4.64 (.66)	2.35 (1.21)
This person disgusts me	1.25 (.69)	3.63 (1.20)
The world would be a better place if this person did not exist	1.15 (.56)	2.78 (1.34)

MANOVA analysis

A two-way MANOVA was used to determine whether there were statistically significant interactions between interpersonal relationship status and the presence of phubbing behavior on each dependent variable, collectively and separately. In contrast to Study 3, the interaction effect between phubbing condition and interpersonal relationship status on the combined dependent variables was statistically significant based on the two-way MANOVA analysis, $F(8, 293) = 2.30$, $p = .02$, Wilks' $\Lambda = .94$, partial $\eta^2 = .06$. Follow up univariate two-way ANOVAs were then conducted. These showed statistically significant interaction effects between phubbing intensity and interpersonal relationship satisfaction only for communication quality, $F(1, 300) = 4.27$, $p = .04$, partial $\eta^2 = .01$, and relationship satisfaction, $F(1, 300) = 5.70$, $p = .02$, partial $\eta^2 = .02$. There was no significant interaction effects for need to belong ($F(1, 300) = .27$, $p = .61$, partial $\eta^2 = .00$), self-esteem ($F(1, 300) = .66$, $p = .42$, partial $\eta^2 = .00$), meaningful existence ($F(1, 300) = .18$, $p = .68$, partial $\eta^2 = .00$), need for control ($F(1, 300) = 2.26$, $p = .13$, partial $\eta^2 = .01$), positive affect ($F(1, 300) = 2.12$, $p = .15$, partial $\eta^2 = .01$), or negative affect ($F(1, 300) = 1.84$, $p = .18$, partial $\eta^2 = .01$). However, the MANOVA analyses were not based on the

structure of the Phubbing Model. Our follow-up approach was to investigate each main effect and to determine whether there were any significant interaction effects for each dependent variable separately.

Effects of Phubbing and Relationship Status

Similar to the first study, we then tested the effects of phubbing and relationship status on fundamental needs, affect, and communication outcomes. We also tested the potential moderating effect of interpersonal relationship condition on the relationship between phubbing intensity and fundamental needs, affect, and communication outcomes based on the Phubbing Model. In order to explore the interaction between the phubbing condition and relationship status condition and further test the model outlined in Figure 5, we used Hayes and Preacher's (2013) PROCESS procedure for SPSS (model 1 and 8, 20,000 resamples, bias corrected) and the multiple-group analysis in AMOS version 25.0.

Participants in the phubbing condition reported more threat to self-esteem ($b = -.71$, $t(300) = -2.32$, $p = .02$) and to meaningful existence ($b = -.72$, $t(300) = -1.97$, $p = .05$), less positive affect ($b = -5.46$, $t(300) = -2.21$, $p = .03$), more negative affect ($b = 5.53$, $t(300) = 2.15$, $p = .03$), and lower communication quality ($b = -.67$, $t(297) = -2.39$, $p = .02$) than those in the control group. There were marginal main effects of phubbing on need to belong ($b = -.59$, $t(300) = -1.81$, $p = .07$) and control ($b = -.44$, $t(300) = -1.80$, $p = .07$). Although there was no significant direct effect of phubbing on relationship satisfaction ($b = -.20$, $t(297) = -1.16$, $p = .25$), the overall model effect of phubbing, via combined direct and indirect pathways, was significant on relationship satisfaction ($F(6,297) = 116.81$, $p < .001$, $R^2 = .70$), as well as on communication quality ($F(6,297) = 96.39$, $p < .001$, $R^2 = .66$), demonstrating effects of phubbing that are consistent with previous research.

Participants who interacted with enemies reporting more threat to self-esteem (b = -.66, t(300) = -4.19, p < .001), meaningful existence (b = -.56, , t(300) = -2.97 p < .01), and need to control (b = -.35, t(300) = -2.80, p < .01), and less positive affect (b = -4.55, t(300) = -3.58, p < .001), more negative affect (b = 3.61, t(300) = 2.73, p < .01), and lower relationship satisfaction (b = -.27, t(297) = -3.04, p < .01) than those who interacted with a friend. However, there was no significant effect of relationship status on the need to belong (b = -.22, t(300) = -1.35, p = .18) and communication quality (b = -.24, t(297) = -1.62, p = .28).

Interaction Effects between Phubbing and Interpersonal Relationship Status

In contrast to Study 3, there was no statistically significant interaction effect between phubbing condition and relationship status on any variables in the path model. The interaction was non-significant for a sense of belongingness (b = -.11, t(300) = -.52, p = .61), self-esteem (b = .16, t(300) = .81, p = .42), meaningful existence (b = .10, t(300) = .42, p = .68), control (b = .23, t(300) = 1.50, p = .13), positive affect (b = 2.28, t(300) = 1.46, p = .15), negative affect (b = -2.20, t(300) = -1.36, p = .18), communication quality (b = .19, t(297) = 1.08, p = .28), and relationship satisfaction (b = .20, t(297) = 1.86, p = .06). As a result, the effect of phubbing intensity in the Phubbing Model was not stronger for friends than for enemies. All regression coefficients, standard errors, and p-values are presented in Table 22.

Table 22
Regression Coefficients (B), Standard Errors (SE), and p-values (p) for the 2x2 Between-subject Phubbing Model

	Consequence																							
	Belonging			Self-esteem			Meaningful existence			Control			PANAS-p			PANAS-n			RAS			ICRr		
Antecedent	B	SE	p	B	SE	p	B	SE	p	B	SE	p	B	SE	p	B	SE	p	B	SE	p	B	SE	p
Phubbing	-.59	.32	.07	-.71	.30	.02	-72	.37	.05	-.44	.25	.07	-5.46	2.47	.03	5.53	2.57	.03	-.20	.17	.25	-.67	.28	.02
Belonging																.			.20	.04	<.001	.28	.06	<.001
PANAS-p																			.03	.00	<.001			
PANAS-n																						-.01	.01	.10
Status	-.22	.17	.18	-.66	.16	<.001	-.56	.19	<.01	-.35	.13	<.01	-4.55	1.27	<.001	3.61	1.32	<.01	-.27	.09	<.01	-.24	.15	.11
Phubbing x Status	-.11	.21	.61	.16	.19	.42	.10	.23	.68	.23	.16	.13	2.28	1.56	.15	-2.20	1.62	.18	.20	.11	.06	.19	.18	.28
Constant	3.88	.26	<.001	3.91	.25	<.001	4.61	.30	<.001	2.74	.20	<.001	25.18	2.01	<.001	10.68	2.09	<.001	.17	.21	.41	2.28	.34	<.001

Multiple-group Analysis

We confirmed the results by conducting the multiple-group analysis in AMOS version 25.0. All paths associated with phubbing were compared between friend and enemy groups. The results revealed that the chi-square differences were non-significant for belonging ($\Delta\lambda^2 = .27$, p = .60), self-esteem ($\Delta\lambda^2 = .66$, p = .42), meaningful existence ($\Delta\lambda^2 = .18$, p = .67), control ($\Delta\lambda^2 = 2.27$, p = .13), positive affect ($\Delta\lambda^2 = 2.12$, p = .15), negative affect ($\Delta\lambda^2 = 1.85$, p = .17), and relationship satisfaction ($\Delta\lambda^2 = 2.71$, p = .10). However, there was a modest but significant chi-square difference for communication quality ($\Delta\lambda^2 = 4.58$, p = .03). The effect of phubbing intensity in the path analysis was not stronger for friends than for enemies, except the effect of phubbing on the quality of communication

which was slightly stronger for friend (β = -.26) than for enemy (β = -.07). All unstandardised coefficients, standard errors, standardised coefficients, significances, and chi-square and degree of freedom values for corresponding constraint relationship are presented in Table 23.

Table 23

Summary of Multiple-group Analysis of Study 4

Path	Friend			Enemy			$\Delta\lambda^2$/df [a]
	B	SE	β	B	SE	β	
Phub → Belonging	-.69***	.15	-.36	-.80***	.14	-.42	.27ns
Phub → Self-esteem	-.55***	.14	-.31	-.39**	.13	-.23	.66ns
Phub → Meaningful existence	-.63***	.16	-.30	-.53**	.17	-.25	.18ns
Phub → Control	-.21*	.11	-.16	.02ns	.11	.02	2.27ns
Phub → PANAS-n	3.33**	1.09	.24	1.13ns	1.20	.08	1.85ns
Phub → PANAS-p	-3.18**	1.24	-.21	-.91ns	.95	-.08	2.12ns
Phub → ICRr	-.65***	.15	-.26	-.17ns	.17	-.07	4.58*
Phub → RAS	-.14ns	.09	-.09	.08ns	.10	.06	2.71ns

Note. B, unstandardised coefficients; SE, standard error; β, standardised coefficients.

[a] Chi-square and degree of freedom values for corresponding constraint relationship.

*** p < .001, ** p < .01, * p < .05, † p < .1, ns p > .1

Discussion

Study 4 was conducted to further understand the interaction between phubbing intensity and interpersonal relationship status on social interaction. Our manipulation checks suggest that all of our manipulations were successful. Participants in the best friend group reported having a different attitude toward their conversation partners compared to those in the worst enemy group. However, following phubbing, the conversation partner's status had almost no effect. Human needs satisfaction, positive affect, negative affect, and

relationship satisfaction were not significantly lower when participants were phubbed by a friend rather than an enemy.

The results from both a regression-based and path analysis approach were almost identical, apart from a small significant interaction effect on communication quality found in the multiple-group analysis using AMOS. We found that being phubbed by a friend caused slightly more distress in communication quality than being phubbed by an enemy. However, there was no significant interaction between interpersonal relationship status and phubbing condition for communication quality in a regression-based approach. Therefore, being phubbed by an enemy was no less distressing overall than being phubbed by a friend.

General Discussion

The present study was conducted to further understand the interaction between phubbing intensity and interpersonal relationship status on social interaction. As predicted, and consistent with previous research on the effect of phubbing, individuals who were phubbed felt less fundamental human needs satisfaction, less positive affect, more negative affect, less communication quality, and less relationship satisfaction than those who were not phubbed. However, our results in the first study demonstrated that most of the reflexive responses to ostracism were not moderated by differences in the status of the interpersonal relationship between the phubber and phubbee. Although we replicated literature indicating that basic human needs and affect mediate the effect of phubbing on interaction outcomes, these mediations were not moderated by the phubbers' relationship with phubbees. Moreover, the conversation partners' relationship status in a controlled dyadic phubbing situation had no impact on relationship satisfaction, and minimal negative impact on perceived communication quality. In particular, communication quality was slightly

lower when participants were phubbed by a friend rather than an enemy. Even though the casual acquaintance condition was removed from the relationship status manipulation of the second study, the results were quite similar to those reported in the first study.

Some limitations should be taken into account when interpreting the results. First, our ability to generalise these results to other populations is limited. Although the participants in Study 3 were sampled from the general population, the participants in Study 4, who were predominately young White females, were sampled from among undergraduate students who participated for course credit. Second, gender differences in phubbing and being phubbed may have implications. Females phub and are phubbed by their companions significantly more than males, and the extent to which females phub their companions predicts perceived social norms of phubbing in women (Chotpitayasunondh & Douglas, 2016). Future research that extends sampling beyond a university environment and includes more males in the sampling population would allow for a more representative assessment of moderators that influence the effect of phubbing. Third, the use of the phubbing animation paradigm also comes with some limitations. It is reasonable to question the extent to which these findings can be generalised to other paradigms. The videos presented animated figures on a screen (see Figure 4 in Chapter 3) and are therefore limited in the extent to which they offer the opportunity to study real-life conversations between enemies, acquaintances, and friends. More research is required to clarify whether other types of manipulation influence factors in the Phubbing Model in different ways.

A further limitation of our research is that the results showed no significant effect of phubbing on need for control in Study 3, and a marginally significant effect in Study 4. A possible reason for this finding is that the internal reliabilities of the five-item need for

control subscale of the NTM were too low in both studies. The relatively low reliability of the need of control subscale should also be addressed in future research. Moreover, even though there were significant overall effects of phubbing on interaction outcomes, there was no significant direct effect of phubbing on ICR in Study 3 or on RAS in both studies. Further studies should re-examine the direct effect of phubbing on these interaction outcomes. In the second study, the interaction effects of phubbing intensity and interpersonal relationship status were inconclusive for the communication quality measure. It is also possible that the communication quality measure, as the only interpersonal measure employed in this study, was moderated differently to the other measures. A meta-analysis of the ordinal effects of ostracism suggested that results from interpersonal measures (i.e., measures relating to others) are more easily moderated by other factors than measures relating to the self (i.e., intrapersonal measures) (Hartgerink, van Beest, Wicherts, & Williams, 2015). That is, the ICR as interpersonal measure was more easily moderated by the phubber's relationship status than other intrapersonal measures employed within our study. This may be the cause of the small significant interaction effect on communication quality found in the multiple-group analysis of Study 4, which one would expect to cohere with effects on other variables. Further studies should also re-examine the interaction effects of phubbing and interpersonal relationship status on the quality of communication.

Chapters 2, 3, and 4 represent an early attempt to not only highlight the potential antecedents and consequences of phubbing, and how phubbing becomes a pervasive norm in modern communication, but also the effects of phubbing and the underpinning psychological mechanisms. However, one limitation of all of this research, and of research on the topic of phubbing as a whole, is that there are no established scales of general

phubbing behaviour. Thus, stringent measures of phubbing behaviour and the experience of being phubbed are needed. These measures will help scholars to discover unexplored psychological factors related to phubbing. The next chapter presents the development and validation of measurements of two constructs associated with phubbing behaviour.

Chapter 5: Measuring Phone Snubbing Behaviour

Abstract

This chapter presents Studies 5, 6, 7, 8, 9, and 10, which were designed to develop and validate the Generic Scale of Phubbing (GSP) to assess phubbing behaviour, and the Generic Scale of Being Phubbed (GSBP) to assess the experience of being phubbed. After reducing and refining items with the assistance of expert panels, exploratory and confirmatory factor analyses were conducted to further reduce the number of items and finalise the scales. Finally, the psychometric properties of both scales were examined. Data from 1,836 respondents from the general public were recruited from six online surveys (n = 352, 333, and 224 for the GSP; n = 358, 341, and 228 for the GSBP). The four-factor 15-item GSP and the three-factor 22-item GSBP were developed and revealed good construct validities, criterion validities, convergent validities, discriminant validities, internal consistency reliabilities, and test-retest reliabilities.

Studies 5, 6, 7, 8, 9, and 10 appear in: Chotpitayasunondh, V., & Douglas, K. M. (2018). Measuring Phone Snubbing Behavior: Development and Validation of the Generic Scale of Phubbing (GSP) and the Generic Scale of Being Phubbed (GSBP), *Computers in Human Behavior, 88*, 5-17.

In previous chapters we identified a number of factors that are linked to phubbing, and how this behaviour has come to be regarded as normative in modern society. Our studies further showed that phubbing behaviour, whether partial or extensive, has a negative impact because it is seen as a form of social exclusion. As such, the more phubbing happens within a conversation, the more it threatens basic human needs, affect, communication quality, and relationship satisfaction. The previous chapter further highlighted the powerful impact of phubbing by demonstrating that the negativity created by phubbing in social interactions tends to be unmoderated by the interpersonal relationship between phubber and phubbee. Although the results in previous chapters lay a foundation on knowledge of phone snubbing behaviour, there is an immense opportunity for additional research to be conducted.

Considering the growing relevance of and interest in phubbing behaviour and the experience of being phubbed, the measuring of these two constructs must now be addressed. Much more research is required to illuminate the psychology of phubbing, but research is limited by the lack of a well-validated measure of individual differences in phubbing and the experience of being phubbed. Having validated, generalisable, psychometrically sound measures is the best way to assess phubbing and the experience of being phubbed, and will help take phubbing research forward. It is also important for researchers to develop measures that are both multidimensional and generalisable. In this chapter, the Generic Scale of Phubbing (GSP) and the Generic Scale of Being Phubbed (GSBP) are developed and validated through Studies 5-7 and Studies 8-10, respectively.

Studies 5 and 8 involved the initial development stages of collating candidate items, using an expert panel to refine the items, and administering the scales to a pool of

participants to establish factor structures. Studies 6 and 9 were designed to replicate these factor structures through confirmatory factor analysis (CFA) and to examine the convergent and concurrent validity of the scales. Studies 7 and 10 aimed to established test-retest reliabilities and discriminant validities of both scales. The participants, who ranged between 18 to 65 years in age, were drawn from general public samples (from North American, European, and Asian countries) to increase generalisability.

Study 5

This study aimed (1) to generate the initial GSP through an exploratory factor analysis, (2) to identify the underlying scale structures, and (3) to examine the GSP's internal consistency. An initial set of items was rated and refined by an expert panel. Participants then completed the scale, and the factor structure and internal consistency of the scale were examined.

Method

Participants

To recruit a diverse general population sample, 361 participants who enrolled in this study were randomly recruited via the crowdsourcing platform Prolific Academic. Participants who completed the questionnaire were paid £0.40. Data from nine participants missing data for two or more items were omitted. A final sample of 352 participants (175 men, 175 women, one transgender, and one participant did not provide any demographic information) from 18 to 61 years of age (M = 34.82, SD = 10.42) completed the online questionnaire. Participants were primarily White/Caucasian (80.6%), full-time workers (51.3%), and had a college-level education (62.7%).

Procedure and Materials

An initial pool of 40 items of the GSP was developed to reflect phubbing behaviour. Items were developed by reviewing the academic literature on phubbing behaviours and phone-associated behavioural addiction behaviours. Each item framed the respondent as a person who starts snubbing his/her communication partner(s) in a social situation by paying attention to his/her phone instead. To prevent acquiescence response bias, both positive and negative coded items were created and employed (Watson, 1992). Next, the 40 items were subjected to an independent expert panel of experienced social psychologists (n = 3), to ensure that each item was understandable and relevant to the subject, and to allow for further item development and refinement. Items rated poorly by experts were revised or removed from the initial item pool. As a result, 33 items were retained at this stage. To emphasise only true phubbing behaviours, the instruction to respondents was as follows:

> "We would like you to think about your mobile phone use during your face-to-face social interactions with others. Think about your social interactions on the whole (e.g., with friends, acquaintances, family, your partner) and the extent to which the following statements apply to you. In my face-to-face social interactions with others …."

Participants responded to items on a seven-point scale, with a label associated with each point (1 = Never, 2 = Rarely, 3 = Occasionally, 4 = Sometimes, 5 = Frequently, 6 = Usually, 7 = Always; $\alpha = .93$, $M = 43.38$, $SD = 16.60$). At the end of the study, participants were debriefed, thanked and paid.

Results

Exploratory factor analysis (EFA) using the principal axis factoring method was conducted to examine the internal structure of the 33-item measure of phubbing behaviour. Based on the observed Eigenvalues and visual inspection of the scree plot, a five-factor solution was initially extracted. All negatively worded items were found to load onto a single factor. As there was no clear conceptual grouping other than their negative phrasing, this was deemed indicative of differential item function rather than a true latent dimension (Greenberger, Chen, Dmitrieva, & Farruggia, 2003). Accordingly, all negatively worded items were dropped. EFA was repeated on the remaining pool of 29 items. The significance of Bartlett's test of sphericity, $\chi^2(406) = 7497.11$, $p < .001$, and the size of the Kaiser-Meyer-Olkin measure of sampling adequacy, KMO = .97, showed that the 29 items had adequate common variance for factor analysis (Tabachnick & Fidell, 2007).

Four factors emerged with Eigenvalues larger than 1.00. The four-factor solution explained 65.72% of the total variance. Promax oblique rotation with a kappa value of 4 was used, based on the assumption that the factors should be related to one another. Following rotation, the first factor accounted for the largest variance. To ensure minimal ambiguity between factors, criteria for an acceptable factor were: (1) the minimum eigenvalue of one, and (2) a minimum of three items loading on each factor (Costello & Osborne, 2005). Item selection was based on the following criteria: (1) if an item loaded less than .5 on a factor, it was discarded, and (2) if an item loaded .5 or greater on a factor but its cross-loading on the other factor was at .32 or higher and there were several adequate to strong loaders on each factor, it was discarded (Tabachnick & Fidell, 2007). As a result, four factors and 15 items were retained for the final version of scale. Factor pattern

matrix loading, item loadings for the first unrotated factor, Eigenvalues, and variance accounted for by each factor are shown in Table 24.

Table 24

GSP Items and Factor Loadings Obtained with Exploratory Factor Analysis

New Code	Item	Factor			
		NP	IC	SI	PA
GSP_1	I feel anxious if my phone is not nearby	**.79**	.02	.13	-.15
GSP_2	I cannot stand leaving my phone alone	**.70**	.18	.13	-.09
GSP_3	I place my phone where I can see it	**.62**	-.15	.05	.11
GSP_4	I worry that I will miss something important if I do not check my phone	**.54**	.27	.04	.02
GSP_5	I have conflicts with others because I am using my phone	-.04	**.84**	.03	-.07
GSP_6	People tell me that I interact with my phone too much	.08	**.66**	.06	.04
GSP_7	I get irritated if others ask me to get off my phone and talk to them	-.10	**.63**	.25	-.00
GSP_8	I use my phone even though I know it irritates others	-.00	**.60**	.08	.23
GSP_9	I would rather pay attention to my phone than talk to others	-.10	.10	**.75**	.02
GSP_10	I feel content when I am paying attention to my phone instead of others	.18	.04	**.69**	-.10
GSP_11	I feel good when I stop focusing on others and pay attention to my phone instead	.20	.22	**.51**	-.20
GSP_12	I get rid of stress by ignoring others and paying attention to my phone instead	.18	.04	**.51**	.16
GSP_13	I pay attention to my phone for longer than I intend to	.15	.06	-.01	**.73**
GSP_14	I know that I must miss opportunities to talk to others because I am using my phone	-.10	.23	.11	**.55**
GSP_15	I find myself thinking “just a few more minutes” when I am using my phone	.21	.22	-.10	**.50**
	Unrotated Eigenvalues	15.24	1.69	1.10	1.03
	% Of variance accounted for following rotation	52.56	5.81	3.80	3.55

Note. Study 5, n = 352. Rotated loadings of EFA above 0.5 are shown in bold. GSP = Generic Scale of Phubbing; NP = Nomophobia; IC = Interpersonal Conflict; SI = Self-isolation; PA = Problem Acknowledgement.

The pattern of loadings reflected conceptually meaningful, cohesive, and distinct groupings. Factor one, which we termed Nomophobia (NP), reflected fear of detachment

from one's mobile phone. This factor contained four items (α = .84). The second factor, which we termed Interpersonal Conflict (IC) contained four items (α = .87) concerning perceived conflict between oneself and others. The third factor, which we termed Self-Isolation (SI), consisted of four items (α = .83) concerning using the phone to escape from social activities and isolate oneself from others. The fourth factor, which we termed Problem Acknowledgement (PA), contained three items (α = .82) relating to acknowledgement that the participant has a phubbing problem. Correlations between factors were positive and moderate to strong, and each factor was strongly correlated with the overall score, as shown in Table 25.

Table 25

Descriptive Statistics and Correlations Between Factor Scores and Overall GSP Score

Factor	M	SD	NP	IC	SI	PA	GSP
NP	14.60	5.62	(.84)				
IC	8.77	4.66	.59	(.87)			
SI	10.89	4.79	.66	.71	(.83)		
PA	9.12	4.15	.65	.71	.67	(.82)	
Overall GSP	43.38	16.60	.86	.86	.88	.86	(.93)

Note. N = 352. All correlations significant at the $p < .001$ level (2-tailed). Cronbach's alphas are shown in the diagonal.

Discussion

The results of a data-driven EFA conducted on a pool of Generic Scale of Phubbing items suggests that four important factors of phubbing are nomophobia, interpersonal conflict, self-isolation, and acknowledgement of problem. The 15 items retained from the original pool of 33 were chosen to represent phubbing behaviour by ensuring variability

across factor loadings. The final four-factor 15-item GSP and its subscales revealed good internal consistencies.

Study 6

This study aimed (1) to replicate the factors of the GSP obtained in Study 5 through confirmatory factor analyses (CFA), (2) to evaluate the model fit, (3) to evaluate the convergent validity and discriminant validity on the scale construct levels, and (4) to examine the concurrent validities and convergent validities of the GSP scale. To examine the concurrent validity, the Phubbing Scale (PS; Karadağ et al., 2015) was employed along with the GSP. The PS was chosen because it was previously established to assess the same construct as the GSP. To examine the convergent validities between measures, the GSP scale was administered to participants along with the instruments of constructs that should theoretically be related (Widaman, Little, Preacher, & Sawalani, 2011). According to the model proposed by Chotpitayasunondh and Douglas (2016), constructs related to phubbing such as Internet addiction, smartphone addiction, and fear of missing out should closely relate to the measure of phubbing in social interactions. As a result, this study employed the Fear of Missing Out scale (FoMOs; Przybylski et al., 2013), which was designed to assess a pervasive apprehension that an individual might be missing what absent others are doing. The fear of missing important information on social media may lead people to turn to their phones rather than interact with the people in their presence. The Smartphone Addiction Scale – Short Version (SAS-SV; Kwon et al., 2013) and Short version of Internet Addiction Test (s-IAT; Pawlikowski, Altstötter-Gleich, & Brand, 2013), which were designed to examine the level of addiction and the problems smartphone and Internet usage causes, were also employed. Phubbing, Internet addiction, and smartphone addiction may

share some similar properties, because people who are addicted to the Internet and their smartphones will use their device uncontrollably, even in a social situation where it is prohibited (Bianchi & Phillips, 2005; Billieux et al., 2014).

Method

Participants

A total of 333 participants (108 males, 223 females, one transgender, and one participant did not provide gender information) were recruited from the crowdsourcing platform Prolific Academic to complete the questionnaire. Participants who took part in the previous study were not able to participate in this study. Participants who completed the questionnaire were paid £0.50. They were all between 18 to 65 years of age (M = 32.06, SD = 9.45), primarily White/Caucasian (90.1%), full-time workers (37.5%), and had college-level education (51.6%). No cases with missing values were found.

Procedure and Materials

To determine how well the models fit to the data, the goodness-of-fit indices were used to evaluate the overall fit of the proposed scale models: the chi-square per degree of freedom (χ^2/df) ratio, the comparative fit index (CFI), the goodness of fit index (GFI), the normal fit index (NFI), the standardised root mean square residual (SRMR), and the root mean squared error of approximation (RMSEA) with confidence intervals. Values close to .06 for the RMSEA and .08 for the SRMR are indicative of an adequate model fit (Hu & Bentler, 1999), as are values close to .90 for the GFI (Dimitrov, 2014) and values close to .95 for the CFI and NFI (Schreiber, Nora, Stage, Barlow, & King, 2006). We hypothesised that the GSP would predict the phubbing outcome of the Phubbing Scale.

According to the Fornell-Larcker testing system, convergent validity and discriminant validity on the scale construct levels were assessed by computing the amount of the variance captured by the construct (i.e., Average Variance Extracted or (AVE), and the shared variance with other constructs (i.e., Composite Reliability or (CR). A level of CR higher than 0.7 indicates that the reliabilities of the constructs are adequate. An AVE value for each construct larger than 0.5 indicates acceptable convergent validity in the level of scale construct. The level of AVE for each attribute higher than all squared inter-construct correlations involving the construct indicates discriminant validity in the construct level (Fornell & Larcker, 1981).

This study employed the Generic Scale of Phubbing (GSP), Phubbing Scale (PS), Fear of Missing Out scale (FoMOs), Smartphone Addiction Scale – Short Version (SAS-SV), and the short version of the Internet Addiction Test (s-IAT). Participants were also asked to indicate their age, gender, occupation, education level, and ethnicity. They were debriefed, thanked, and paid. AMOS version 24.0 was used to conduct a CFA on the 15-item GSP produced from Study 5 using a four-factor structure. The intercorrelations between variables, internal consistency reliabilities, convergent validities, and concurrent validities were computed by using SPSS software.

Generic scale of phubbing. The 15-item GSP scale developed from Study 5 was used without modification (α range from .85 to .92, M = 45.84, SD = 18.65).

Phubbing scale. The Phubbing scale consists of 10 items determining the extent to which individuals are distracted from conversation partners, connected with their phones, and escape social communication. Participants rated themselves from 1 (never) to 5 (always) on a five-point scale (α = .88, M = 2.32, SD = 0.76). Items included: “My eyes

start wandering on my phone when I'm together with others", "I feel incomplete without my mobile phone", and "My mobile phone use increases day by day" (Karadağ et al., 2015).

Fear of missing out scale. The FoMOs, developed by Przybylski et al. (2013) is a 10-item questionnaire asking respondents to rate how well statements (e.g., "I get anxious when I don't know what my friends are up to" and "When I miss out on a planned get-together it bothers me") describe them on a five-point scale (1 = not at all true for me, 5 = extremely true of me; $\alpha = .86$, $M = 2.31$, $SD = 0.79$).

Smartphone addiction scale – short version. The 10-item SAS-SV was shortened and modified from the original 33-item Smartphone Addiction Scale (SAS). This scale's items were designed to assess the level of smartphone addiction risk such as "Feeling impatient and fretful when I am not holding my smartphone" and "Having my smartphone on my mind even when I am not using it" (Kwon et al., 2013). Participants responded on a six-point scale (1 = strongly disagree, 6 = strongly agree; $\alpha = .90$, $M = 26.41$, $SD = 10.43$).

Short version of Internet addiction test. This instrument was shortened from the original 20-item Internet Addiction Test (IAT). The 12-item s-IAT, rated on a five-point scale (1 = rarely, 5 = always; $\alpha = .90$, $M = 24.53$, $SD = 9.15$), assesses Internet-addictive behaviour based on the DSM-IV criteria (Diagnostic and Statistic Manual of Mental Disorder, 4th Edition) for pathological gambling and alcoholism such as "How often do you feel preoccupied with the Internet when offline, or fantasise about being online?" and "How often do you choose to spend more time online over going out with others?" (Pawlikowski et al., 2013).

Results

All means, standard deviations, and Pearson product-moment correlation coefficients calculated among all variables are shown in Table 26. The intercorrelations between all variables were as expected.

Table 26

Means, Standard Deviations, and Intercorrelations Between Variables in Study 6

Factor	M	SD	GSP	NP	IC	SI	PA	PS	FoMOs	SAS-SV	s-IAT
GSP	45.84	18.65	(.94)								
NP	15.84	5.58	.70[a]	(.85)							
IC	9.61	5.50	.76[a]	.63	(.90)						
SI	9.93	5.80	.77[a]	.62	.71	(.92)					
PA	10.45	4.76	.76[a]	.63	.67	.70	(.86)				
PS	2.32	0.76	.85	.73	.75	.71	.75	(.88)			
FoMOs	2.31	0.79	.51	.45	.43	.43	.45	.53	(.86)		
SAS-SV	26.41	10.43	.80	.68	.70	.66	.71	.76	.51	(.90)	
s-IAT	24.53	9.15	.75	.57	.63	.74	.64	.72	.54	.71	(.90)

Note. $N = 333$. All correlations were significant at the $p < .001$ level (2-tailed).
[a] Correlations between GSP subscales and total were computed with the subscale removed from the total score. Cronbach's alphas are shown in the diagonal. PS = Phubbing Scale; FoMOs = Fear of Missing Out Scale; SAS-SV = Smartphone Addiction Scale – Short Version; s-IAT = Short Version of Internet Addiction Test.

Factor Analyses and Construct Validity

CFAs were performed, comparing the proposed four-factor construct model with an alternative unidimensional construct model with all items loaded onto only one factor. We compared the two models using the standard fit indices (χ^2/df, CFI, GFI, RMR, and RMSEA). The one-factor model displayed a poor fit according to those indices (χ^2 (90, *N*

= 333) = 840.23, $p < .001$, $\chi^2/df = 9.34$, CFI = .80, GFI = .70, NFI = .78, SRMR = .08, RMSEA = .16), while the second-order four-factor model displayed a better fit (χ^2 (86, N = 333) = 260.36, $p < .001$, $\chi^2/df = 3.03$, CFI = .95, GFI = .90, NFI = .93, SRMR = .04, RMSEA = .08). The model with four factors was more parsimonious and had more theoretically expected model parameters. The model was further re-modified by adjusting one covariance path at a time on the basis of modification indices and par changes (Schreiber et al., 2006). An investigation of model modification indices indicated the need to add two covariance paths, i.e., e5–e6 and e13–e15. Results from modified model depicted in Figure 6 displayed even more acceptable fit indices (χ^2 (84, N = 333) = 184.37, $p < .001$, χ^2/df = 2.20, CFI = .97, GFI = .93, NFI = .95, SRMR = .04, RMSEA = .06).

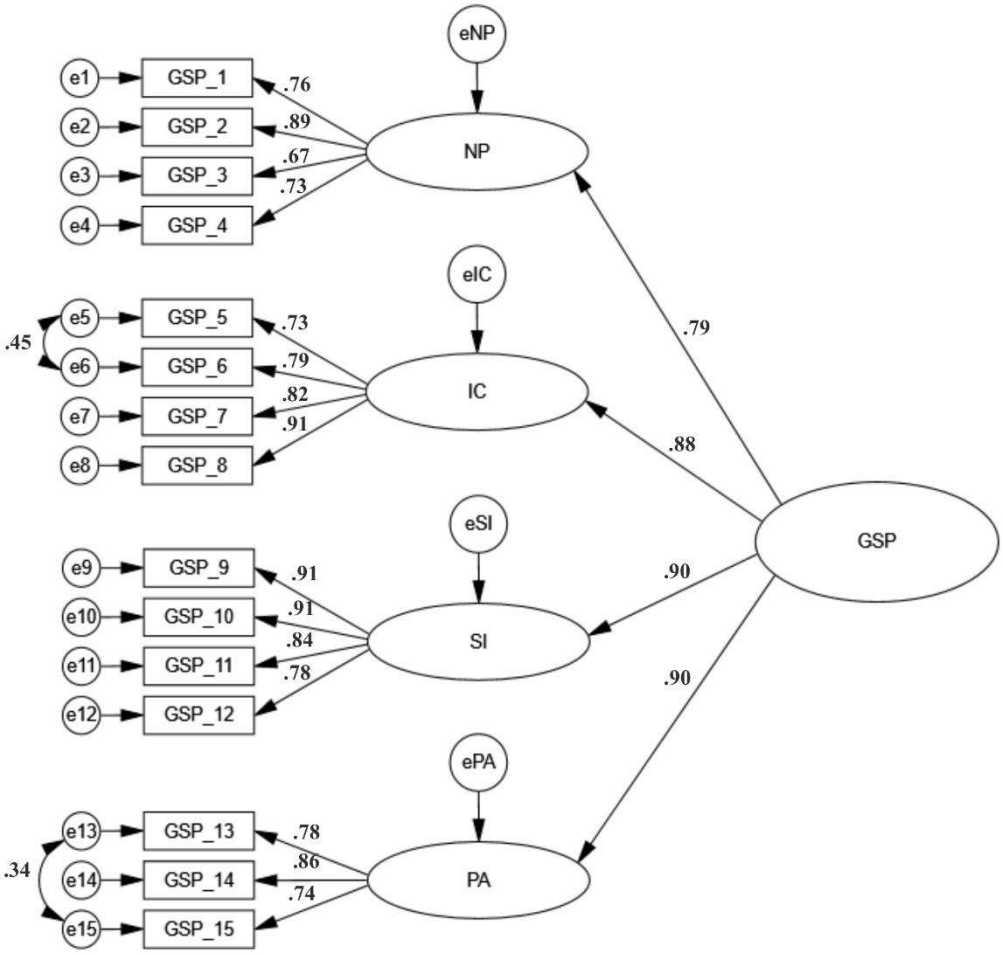

Figure 6. The Generic Scale of Phubbing second-order confirmatory factor analysis path diagram indicating the four first-order factors loading onto a single second-order GSP factor. The diagram shows standardised regression weights and covariances.

To determine reliability, convergent validity, and discriminant validity on the level of scale construct, the Average Variance Extracted (AVE) and the Composite Reliability (CR) were computed. As seen in Table 27, each construct's CR was higher than 0.7, which indicates that the reliabilities of the constructs were adequate (Fornell & Larcker, 1981). Moreover, the AVE for each attribute was larger than 0.5, which indicates convergent

validity at the construct level, and was higher than all squares of inter-construct correlations – i.e., shared variances – which is an indicator of discriminant validity between the constructs according to Hair, Black, Babin, and Anderson (2010).

Table 27

AVEs, CRs, and Shared Variances for Each GSP Construct

			Shared Variance			
	AVE	CR	NP	IC	SI	PA
Nomophobia	0.59	0.85	1			
Interpersonal Conflict	0.69	0.90	.40	1		
Self-isolation	0.74	0.92	.38	.50	1	
Problem Acknowledgement	0.68	0.86	.40	.45	.49	1

Convergent Validity

If the GSP instrument has convergent validity in the between-scale level, then constructs similar to GSP (e.g., Internet addiction, smartphone addiction, and fear of missing out) should relate closely to the measure of phubbing behaviour. As seen in Table 26, mean GSP scores strongly correlated with scores on the SAS-SV ($r = .80$, $p < .001$) and s-IAT ($r = .75$, $p < .001$). Additionally, GSP scores showed moderate correlation with FoMO scores ($r = .51$, $p < .001$).

Criterion-related Validity

To examine concurrent validity, the correlation coefficient between the GSP and PS was calculated. The total score on the GSP correlated positively and significantly with the two-factor 10-item PS, $r = .85$, $p < .001$. A standard multiple regression analysis was conducted with PS as the criterion variable and the scores on each GSP subscale as criterion

predictors. The multiple regression model of the GSP statistically significantly predicted phubbing behaviours in the general population, $F(4, 328) = 219.46$, $p < .001$. The average GSP score accounted for 72.8% of the variation in phubbing behaviour with adjusted R^2 = 72.5%, a large size effect according to Cohen (1988). Nomophobia (NP) was the strongest predictor of the regression model (see Table 28 for standardised β values, *t*-test, and *p*-values).

Table 28

Results of Multiple Regression Analysis with GSP Subscale Scores Predicting the Phubbing Scale Scores

Factor	β	*t*	*p*
Nomophobia	.30	7.37	< .001
Interpersonal Conflict	.28	6.18	< .001
Self-isolation	.13	2.89	< .01
Problem Acknowledgement	.28	6.32	< .001

Discussion

The results indicated that the GSP had acceptable psychometric properties. The results of the confirmatory factor analysis suggest that the intended second-order four-factor measurement structure was retained in the 15-item GSP. Moreover, all items loaded strongly and significantly on their factors (exceeded .50). The 15-item GSP's construct reliability, convergent validity, and discriminant validity on the construct level were excellent, as well as its internal consistency reliability, concurrent validity, and convergent validity on the scale level.

Study 7

This study aimed (1) to explore the scale test-retest reliability, and (2) to evaluate the discriminant validity of the GSP scale. To ensure the establishment of scale's test-retest reliability, the GSP was administered twice, with a four-week interval. In order to examine the discriminant validities between measures, the GSP scale was administered to participants along with the instruments that are assumed to measure the different constructs (Widaman et al., 2011). It is important to demonstrate that the measure of phubbing behaviour constructs is independent of psychological constructs. As a result, the IPIP Introversion Scale (Goldberg et al., 2006), the Schizotypal Personality Questionnaire-Brief Form (Raine & Benishay, 1995), and the Social Desirability Scale (Stöber, 2001) were employed in this study. The GSP should measure true phubbing behaviour of the phubber rather than the avoidance of eye contact by introverts or individuals with a schizotypal personality. It should also measure the level of phubbing behaviour rather than the level of social desirability orientation in individuals who are low in communication apprehension. We would therefore only expect small or non-significant correlations between phubbing and these factors.

Method

Participants

A total of 224 participants (111 males, 112 females, and one transgender) were randomly recruited from the crowdsourcing platform Prolific Academic to complete the questionnaire (Time 1 completion). A subsample of 165 participants (73.66% retention rate) completed the questionnaire in a follow-up measurement, i.e., Time 2. Participants who took part in previous studies were not able to participate in this study. Participants

were paid £0.50 for Time 1 completion and an additional £0.17 for Time 2 completion. The ages ranged between 18 and 65 years (M = 33.17, SD = 10.80). Participants were primarily White/Caucasian (88.4%), full-time workers (43.8%), and had college-level education (63.8%). No cases with missing values were found.

Procedure and Materials

This study aimed to establish test-retest reliabilities and discriminant validities of the instrument. A four-week timeframe was considered long enough to ensure that participants would not recall previous questionnaire responses (Anastasi & Urbina, 1997). The participants were also not able to view their previous responses. The ICC estimates and their 95% confidence intervals were calculated based on an absolute-agreement and two-way mixed-effects model. A t-test was also conducted to examine whether there was a statistically significant difference in GSP score over time. Results from GSP over two points in time should be stable and reproducible over time when used on the same respondents. In order to examine the discriminant validities between measures, the correlation coefficients are expected to be no correlation to moderate correlation ($0 \leq r \leq .6$), indicating a divergent validity of the measures compared (Netemeyer, Bearden, & Sharma, 2003).

The Generic Scale of Phubbing (GSP), the IPIP Introversion Scale (Goldberg et al., 2006), the Social Desirability Scale (Stöber, 2001), and the Schizotypal Personality Questionnaire-Brief Form (Raine & Benishay, 1995) were employed in this study. Participants were also asked to indicate their age, gender, occupation, education level, and ethnicity. They were then debriefed, thanked, and paid. Test-retest data were collected from participants who completed the questionnaire at Time 1 and Time 2 (N = 165). The GSP was the only instrument administered at Time 2.

Generic scale of phubbing. The 15-item GSP scale developed from Study 5 was used in its original form. The internal reliabilities of the GSP scale in this study were excellent (α range from .86 to .93 for Time 1 and α range from .86 to .92 for Time 2).

IPIP introversion scale. Introversion was measured using the 10-item IPIP introversion scale (Goldberg et al., 2006). Participants were asked to rate how well statements (e.g., "Want to be left alone" and "Enjoy spending time by myself") describe them on a five-point Likert scale (1 = very inaccurate, 5 = very accurate; α = .83, *M* = 35.97, *SD* = 6.55). Higher scores reflected higher levels of introversion.

Social desirability scale. The 17-item SDS-17 scale is a measure of behaviours that are considered socially desirable (Stöber, 2001). Participants respond to each statement (e.g., "In conversations I always listen attentively and let others finish their sentences" and "I always stay friendly and courteous with other people, even when I am stressed out") on a dichotomous response format, labelled "*True*" and "*False*," resulting in a score of 1 or 0 points, respectively (α = .64, *M* = 9.80, *SD* = 3.08). Higher scores indicated higher levels of social desirability.

Schizotypal personality questionnaire – brief form. This SPQ-B scale (Raine & Benishay, 1995), developed from the original SPQ (Raine, 1991), is a 22-item self-administered questionnaire with a dichotomous response format (1 = Yes, 0 = No; α = .83, *M* = 10.79, *SD* = 4.95). This measure consists of items assessing schizotypal personality traits such as "I feel very uncomfortable in social situations involving unfamiliar people" and "I tend to keep in the background on social occasions". Higher scores indicated higher levels of schizotypal personality.

Results

Discriminant Validity

Small negative correlations were found between phubbing behaviour and introversion (r = -.14, p < .05), and between phubbing behaviour and social desirability (r = -.13, p < .05). A small positive correlation was found between phubbing behaviour and schizotypal personality (r = .28, p < .001). Low to moderate correlations are determined as evidence of discriminant validity (Bearden & Netemeyer, 1999) and therefore verify that phubbing measures are a different construct to the other measured variables.

Test-retest Reliability

Within the test-retest sample (N = 165), mean GSP scores at Time 1 (Day 0) and Time 2 (Day 28) were 42.08 (SD = 17.03) and 41.93 (SD = 16.64), respectively. The intraclass correlation coefficient (ICC) was conducted and showed an excellent degree of reliability index in test-retest. The average measure ICC of the GSP was .90 with a 95% confidence interval from .86 to .93, F(164, 164) = 10.00, p < .001. The Pearson's correlation and ICC results of each subscales are also shown in Table 29. The correlation between mean GSP scores at Time 1 and Time 2 was positive and strong (r = .82, p < .001). Additionally, a paired samples t-test was also conducted to confirm the scale's repeatability. Results revealed that overall mean GSP scores and mean scores from each subscale did not change significantly over the four-week interval, as shown in Table 29.

Table 29

Correlations Between GSP (Time 1) and (Time 2), Paired Samples t-test and ICC Results

GSP (Time 1)	GSP (Time 2)		Paired Samples t-test				Interclass Correlation Coefficients			
	r	p	t	95% CI	p	d	ICC	95% CI	F	p
GSP	.82	< .001	.19	-1.41 - 1.71	.85	.01	.90	.87 - .93	10.01	< .001
NP	.75	< .001	1.35	-.18 - .94	.18	.11	.86	.81 - .90	7.12	< .001
IC	.76	< .001	1.06	-.24 - .80	.29	.08	.86	.82 - .90	7.37	< .001
SI	.66	< .001	-1.74	-1.22 - .08	.08	-.14	.79	.72 - .85	4.82	< .001
PA	.77	< .001	.25	-.42 - .54	.80	.02	.87	.83 - .91	7.80	< .001

Note. N = 165. GSP = Generic Scale of Phubbing; NP = Nomophobia; IC = Interpersonal Conflict; SI = Self-isolation; PA = Problem Acknowledgement.

Discussion

The pattern of small correlations provides evidence for the discriminant validity of the GSP scale. The GSP was either independent of other theoretically unrelated psychological constructs or at most only weakly associated with them. Additionally, both results from a paired samples *t*-test and ICC indicated that overall mean scores of the GSP slightly decreased but did not significantly change over time, which proved the scale's test-retest reliability.

In conclusion, the four-factor 15-item Generic Scale of Phubbing (GSP) was developed through Studies 5, 6, and 7. After reducing and refining items with the assistance of expert panels, exploratory and confirmatory factor analyses were conducted to further reduce the number of items and finalise the scales. Finally, the psychometric properties of the GSP scale were examined. The GSP scale revealed good construct

validities, criterion validities, convergent validities, discriminant validities, internal consistency reliabilities, and test-retest reliabilities. The GSP scale can therefore be used as a tool to measure the unique behaviour of phubbing in social interaction.

Study 8

This study aimed (1) to generate the initial Generic Scale of Being Phubbed (GSBP) through an exploratory factor analysis, (2) to identify the underlying scale structures, and (3) to examine the GSBP's internal consistency. As for the GSP, an initial pool of items was reviewed, rated, and modified by an expert panel. After participants completed the scale, the factor structure and the internal reliability of the scale were examined.

Method

Participants

Three hundred and sixty-four participants were recruited from the crowdsourcing platform Prolific Academic to participate in this study. Participants who took part in the GSP studies were not able to participate in this study. Participants who completed the questionnaire were paid £0.40. Data from six participants missing data for two or more items were omitted. A total of 358 participants (130 males, 226 females, one transgender, and one participant did not provide gender information) completed the questionnaire. Age ranged from 18 to 63 years ($M = 36.00$, $SD = 10.83$). Participants were primarily White/Caucasian (89.1%), full-time workers (53.9%), and had college-level education (58.7%).

Procedure and Materials

An initial pool of 40 items of the GSBP was developed to represent the experience of being phubbed. Items were generated by reviewing the academic literature on the

experience of being phubbed and other social connectedness theories. Each item framed the respondent as a person who is ignored by his/her communication partner(s) in a social interaction because his/her communication partner(s) use their phones instead. The 40 items were then subjected to an independent expert panel of experienced social psychologists (n = 3), to ensure that each item was understandable, relevant and comprehensive, and to allow for further item development and refinement. Items that were rated poorly by experts were revised or removed from the initial item pool. Similar to the GSP, 33 items were retained at this stage. To only emphasise the experience of being phubbed, the instructions to respondents were as follows:

> "We would like you to think about others' mobile phone use during your face-to-face social interactions with others. Think about your social interactions on the whole (e.g., with friends, acquaintances, family, your partner) and the extent to which the following statements apply to you. In my face-to-face social interactions with others …."

Participants rated items on a seven-point Likert-type scale (1 = Never, 2 = Rarely, 3 = Occasionally, 4 = Sometimes, 5 = Frequently, 6 = Usually, 7 = Always; $\alpha = .96$, $M = 86.54$, $SD = 24.09$).

Results

EFA using the principal axis factoring method was conducted to examine the internal structure of the 33-item measure of phubbing behaviour. Based on the observed Eigenvalues and visual inspection of the scree plot, a three-factor solution was initially extracted. Four negatively worded items were found to load onto a single factor similar to the items in GSP and were dropped. EFA was repeated on the remaining pool of 29 items.

The significance of Bartlett's test of sphericity, $\chi^2(406) = 7972.75$, $p < .001$, and the size of the Kaiser-Meyer-Olkin measure of sampling adequacy, KMO = .98, showed that the 29 items had adequate common variance for factor analysis (Tabachnick & Fidell, 2007).

The three-factor solution explained 64.14% of the total variance. Promax oblique rotation was used based on the assumption that the factors should be related to one another. Following rotation, the first factor accounted for the largest variance. Criteria for an acceptable factor and item selection were similar to those used in the GSP study. As a result, three factors and 22 items were retained for the final version of scale. Factor pattern matrix loading, item loadings for the first unrotated factor, Eigenvalues, and variance accounted for by each factor are shown in Table 30.

Table 30

GSBP Items and Standardised Factor Loadings Obtained with Exploratory Factor Analysis

Code	Item	Factor		
		PN	FI	IC
GSBP_1	Others seem to check their phones for messages and social media updates	**.87**	.06	-.16
GSBP_2	Others seem to be using their phones to go online	**.76**	.12	-.21
GSBP_3	Others place their phones where they can see them	**.75**	-.09	-.05
GSBP_4	Others seem worried that they will miss something important if they do not check their phones	**.71**	.02	.08
GSBP_5	Others seem like they lose awareness of their surroundings because of their phone use	**.70**	-.09	.20
GSBP_6	Others seem like they have a difficult time putting their phones down	**.66**	.12	.11
GSBP_7	Others seem like they cannot stand leaving their phones alone	**.65**	.04	.14
GSBP_8	Others seem like they are "in their own worlds" using their phones	**.61**	.11	.13
GSBP_9	Others seem anxious if their phones are not nearby	**.58**	-.01	.20
GSBP_10	Others pay attention to their phones rather than talking to me	-.07	**.94**	-.00
GSBP_11	Others would rather pay attention to their phones than talk to me	-.03	**.83**	.08
GSBP_12	Others seem like they get rid of boredom by paying attention to their phones instead of me	.14	**.73**	-.08
GSBP_13	Others seem like they feel content when they are paying attention to their phones instead of me	.14	**.69**	.00
GSBP_14	Others pay attention to their phones rather than focusing on me	.08	**.64**	.19
GSBP_15	Others seem like they get rid of stress by paying attention to their phones instead of me	.08	**.60**	.11
GSBP_16	Others seem like they feel good when they stop focusing on me and pay attention to their phones instead	.03	**.58**	.14
GSBP_17	Others shift their attention from me to their phones	.19	**.52**	.16
GSBP_18	I tell others that they interact with their phones too much	.09	-.17	**.87**
GSBP_19	I have conflicts with others because they are using their phones	-.16	.09	**.86**
GSBP_20	I find myself thinking "I've had enough" when others are using their phones	.08	-.03	**.73**
GSBP_21	Others use their phones even though they know it irritates me	-.14	.30	**.70**
GSBP_22	Others seem like they get irritated if I ask them to get off their phones and talk to me	.01	.26	**.59**
	Unrotated Eigenvalues	15.92	1.65	1.02
	% Of variance accounted for following rotation	54.91	5.70	3.54

Note. Study 8, n = 358. Rotated loadings of EFA above 0.5 are shown in bold. GSBP = Generic Scale of Being Phubbed; PN = Perceived Norms; FI = Feeling Ignored; IC = Interpersonal Conflict.

The pattern of loadings reflected conceptually meaningful, cohesive, and distinct groupings. Factor one, which we termed Perceived Norms (PN), reflected descriptions of what others do with their phones. This factor contained nine items ($\alpha = .92$). A second factor, which we termed Feeling Ignored (FI) contained eight items ($\alpha = .94$) concerning feeling ignored by others' phone use. A third factor, which we termed Interpersonal Conflict (IC), consisted of five items ($\alpha = .90$) concerning perceived conflict between oneself and others due to mobile phone use. Correlations between factors were moderate to strong and positive, and each factor was strongly correlated with the overall score, as shown in Table 31.

Table 31

Descriptive Statistics and Correlations Between Factor Scores and Overall GSBP Score

Factor	M	SD	PN	FI	IC	GSBP
PN	41.79	10.25	(.92)			
FI	28.69	9.35	.80	(.94)		
IC	16.05	6.68	.68	.78	(.90)	
Overall GSBP	86.54	24.09	.92	.94	.87	(.96)

Note. $N = 358$. All correlations significant at the $p < .001$ level (2-tailed). Cronbach's alphas are shown in the diagonal.

Discussion

The results of an EFA conducted on a pool of Generic Scale of Being Phubbed items suggest that three important factors of being phubbed are perceived norms, feeling ignored, and interpersonal conflict. The 22 items retained from the pool of 33 were chosen

to represent the experience of being phubbed by ensuring variability across factor loadings. The three-factor 22-item GSBP revealed excellent internal consistencies.

Study 9

This study aimed (1) to replicate the factors of the GSBP obtained in Study 8 through confirmatory factor analyses (CFA), (2) to evaluate the model fit, (3) to evaluate the convergent validity and discriminant validity on the scale construct levels, and (4) to examine the concurrent and convergent validities of the GSBP scale. To examine the concurrent validity, the Partner Phubbing Scale (Pphubbing; Roberts & David, 2016) was employed along with the GSBP. The Pphubbing was chosen because it was previously developed to assess the same construct of being phubbed, but in a specific situation. To examine the convergent validities between measures, the GSBP scale was administered to participants along with the instruments of constructs that should theoretically be related (Widaman et al., 2011). Constructs related to phubbing such as social connectedness, belongingness, friendship, and perceived social support should relate closely to the measure of being phubbed in social interactions. Since being phubbed in social interaction significantly reduces feelings of belongingness (Chotpitayasunondh & Douglas, 2018), we hypothesised that the GSBP would correlate with the General Belongingness Scale (GBS; Malone, Pillow, & Osman, 2012) – a measure that suggested a sense of belongingness. Since the experience of being phubbed also reflects poor social interaction and connectedness, we expected that the GSBP would correlate with the Social Connectedness Scale (SCS; R. M. Lee & Robbins, 1995), which was designed to assess a sense of connectedness with society. Moreover, it is also possible that individuals who are ignored by their companions in social interactions may perceive social isolation and lack of social

support from their companions. Thus, we hypothesised that the GSBP should correlate with the Friendship Scale (FS; Hawthorne, 2006), which measures perceived social isolation and social support, and the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988), which was designed to assess perceptions of social support adequacy from friends, family, and a significant other.

Method

Participants

Participants were recruited via Prolific Academic. Again, those who took part in previous studies were not able to participate in this study. Participants who completed the questionnaire were paid £0.59. A total of 341 participants (133 male, 205 female, two transgender, and one participant did not provide gender information) completed the questionnaire. Their ages ranged between 18 to 73 years ($M = 33.14$, $SD = 11.24$). Participants were predominately White/Caucasian (89.4%), full-time workers (40.2%), and had college-level education (59.5%). No cases with missing values were found.

Procedures and Materials

This study aimed to replicate the factors of the GSBP obtained in the previous phase through CFA, and to examine the concurrent and convergent validities of the GSBP scale. To determine how well the models fit to the data, the goodness-of-fit indices, i.e., χ^2/df ratio, CFI, GFI, NFI, SRMR, and RMSEA, were examined to evaluate the overall fit of the proposed scale models. We hypothesised that the GSBP should predict the being-phubbed outcome of the Partner Phubbing Scale. According to the Fornell-Larcker testing system, convergent validity and discriminant validity on the scale construct levels were assessed by

computing the AVE and CR values. The study's criteria for acceptable χ^2/df, CFI, GFI, NFI, SRMR, RMSEA, AVE, and CR values were similar to the criteria used in Study 6.

The Generic Scale of Being Phubbed (GSBP), Partner Phubbing Scale (Pphubbing), Social Connectedness Scale (SCS), General Belongingness Scale (GBS), Friendship Scale (FS), and Multidimensional Scale of Perceived Social Support (MSPSS) were employed in this study. Participants were also asked to indicate their age, gender, occupation, education level, and ethnicity. They were debriefed, thanked, and paid. CFA was conducted by using AMOS software on the 22-item scale to test the fit of the three-factor model identified in Study 8 in relation to the two competing alternative models. The intercorrelations between variables, internal consistency reliabilities, convergent validities, and concurrent validities were also computed by using SPSS software.

Generic scale of being phubbed. The 22-item GSBP scale developed from Study 8 was used without modification (α range from .92 to .97, M = 90.22, SD = 26.48).

Partner phubbing scale. The Pphubbing Scale consists of nine items determining the extent to which an individual's romantic partner uses or is distracted by his/her mobile phone during time together (Roberts & David, 2016). Participants rated themselves from 1 (never) to 5 (always) on a five-point Likert scale on items such as "My partner places his or her cell phone where they can see it when we are together", "My partner glances at his/her cell phone when talking to me", and "My partner uses his or her phone when we are out together" (α = .92, M = 2.89, SD = 0.99).

Social connectedness scale. The negatively worded eight-item SCS, developed by R. M. Lee and Robbins (1995), was designed to assess the sense of social connectedness, affiliation, and companionship by asking participants to rate how much they agree with

statements such as “Feeling impatient and fretful when I am not holding my smartphone”, “I have no sense of togetherness with my peers”, and “I don’t feel that I participate with anyone or any group”. Participants responded on a six-point Likert scale with an inverse direction of the rating system (1 = strongly agree, 6 = strongly disagree; $\alpha = .95$, M = 33.90, SD = 9.58). A higher score indicates a better-perceived sense of connectedness and belongingness in social situations.

General belongingness scale. The 12-item GBS, rated on a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree; $\alpha = .95$, M = 58.14, SD = 14.86), assesses a general sense of achieved belongingness such as “When I am with other people, I feel included”, “I feel as if people do not care about me”, and “When I am with other people, I feel like a stranger” (Malone et al., 2012). Scores were reversed on negatively worded items.

Friendship scale. The FS consists of six items, rated from 0 (not at all) to 4 (almost always) on a five-point Likert scale ($\alpha = .87$, M = 16.10, SD = 5.33). The scale items assess social connection and social isolation such as “It has been easy to relate to others”, “I had someone to share my feeling with”, and “When with other people, I felt separate from them” (Hawthorne, 2006). A higher score indicates stronger social connectedness.

Multidimensional scale of perceived social support. The MSPSS, developed by Zimet et al. (1988), is a 12-item scale asking respondents to rate how well statements (e.g., “There is a special person who is around when I am in need”, “I can count on my friends when things go wrong”, and “I can talk about my problems with my family”) describe them on a seven-point Likert scale (1 = very strongly disagree, 7 = very strongly agree; $\alpha = .93$,

M = 5.23, SD = 1.20). This scale was designed to assess the perceived adequacy of social support relating to the source (i.e., family, friends, and significant others).

Results

The means, standard deviations, and Pearson product-moment correlation coefficients calculated among all variables are shown in Table 32. The intercorrelations between variables were all as expected.

Table 32

Means, Standard Deviations, and Intercorrelations Between Variables of Study 9

Factor	M	SD	GSBP	PN	FI	IC	Pphub	SCS	GBS	FS	MSPSS
GSBP	90.22	26.48	(.97)								
PN	43.92	10.18	.74[a]***	(.92)							
FI	29.81	11.34	.83[a]***	.75***	(.97)						
IC	16.57	7.97	.73[a]***	.61***	.74***	(.94)					
Pphub	2.89	.99	.31***	.31***	.25***	.28***	(.92)				
SCS	33.90	9.58	-.20***	-.11*	-.23***	-.21***	-.10	(.95)			
GBS	58.14	14.86	-.15**	-.04	-.18**	-.19***	-.06	.89***	(.95)		
FS	16.10	5.33	-.13*	-.02	-.17**	-.16**	-.03	.82***	.89***	(.87)	
MSPSS	5.23	1.20	-.06	.01	-.07	-.09	-.06	.54***	.63***	.65***	(.93)

Note. N = 341. [a] Correlations between GSBP subscales and total were computed with the subscale removed from the total score. Cronbach's alphas are shown in the diagonal. Pphub = Partner Phubbing Scale; SCS = Social Connectedness Scale; GBS = General Belongingness Scale; FS = Friendship Scale; MSPSS = Multidimensional Scale of Perceived Social Support.
*** $p < .001$
** $p < .01$
* $p < .05$

Factor Analyses and Construct Validity

The CFAs were performed, comparing the proposed three-factor construct model with an alternative unidimensional construct model with all items only loaded onto one factor. We compared the two models using the standard fit indices (χ^2/df, CFI, GFI, RMR, and RMSEA). The one-factor model displayed a poor fit according to those indices (χ^2 (209, N = 341) = 2028.59, $p < .001$, χ^2/df = 9.71, CFI = .76, GFI = .54, NFI = .74, SRMR = .09, RMSEA = .16); the second-order three-factor model a displayed better fit (χ^2 (206, N = 341) = 783.77, $p < .001$, χ^2/df = 3.81, CFI = .92, GFI = .82, NFI = .90, SRMR = .05, RMSEA = .09). The model with three factors was more parsimonious and had more theoretically expected model parameters. The model was further re-modified by adjusting one covariance path at a time on the basis of modification indices and par changes (Schreiber et al., 2006). An investigation of model modification indices indicated the need to add eight covariance paths, i.e., e1 – e2, e2 – e9, e4 – e8, e6 – e7, e10 – e11, e12 – e17, e15 – e16, e18 – e19. The results from the modified model depicted in Figure 7 displayed improved acceptable fit indices (χ^2 (198, N = 341) = 433.96, $p < .001$, χ^2/df = 2.19, CFI = .97, GFI = .90, NFI = .94, SRMR = .04, RMSEA = .06).

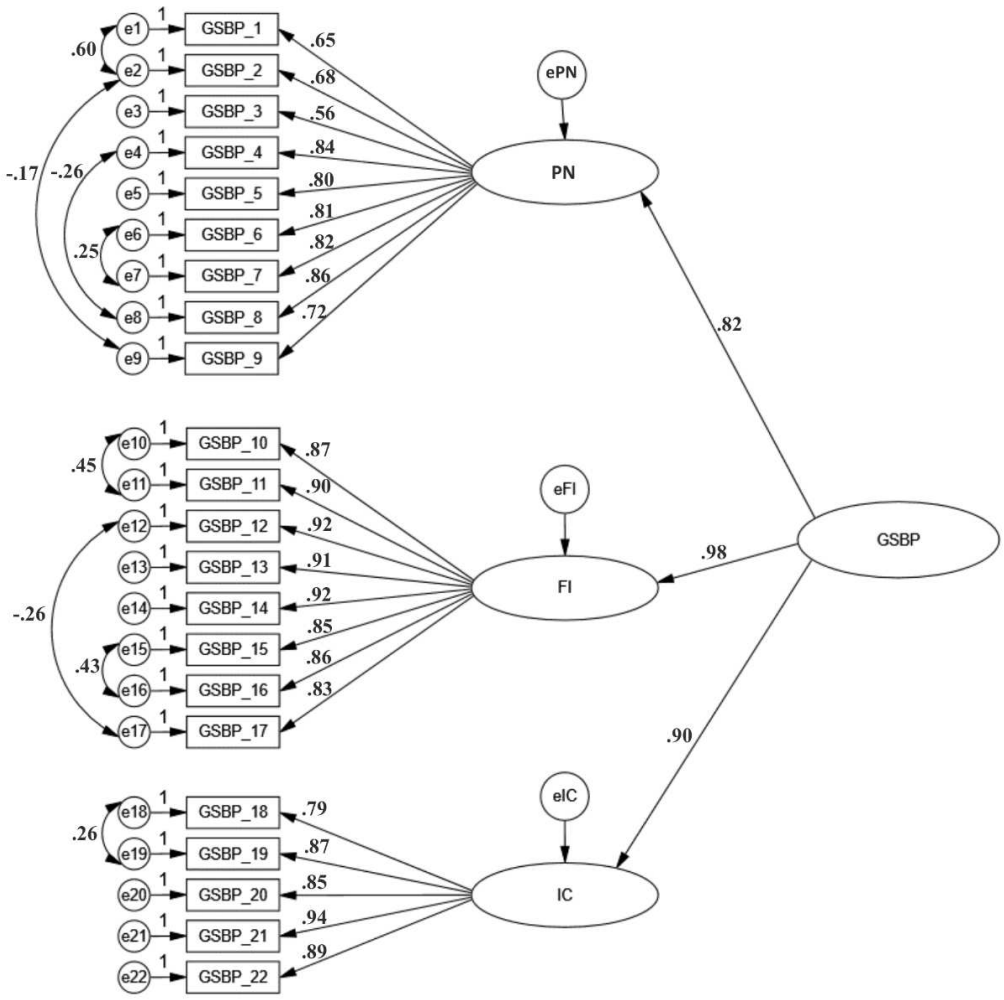

Figure 7. The Generic Scale of Being Phubbed second-order confirmatory factor analysis path diagram indicating the three first-order factors loading onto a single second-order GSBP factor. The diagram shows standardised regression weights and covariances.

To determine reliability, convergent validity, and discriminant validity on the construct level, the AVE and the CR were calculated. As seen in Table 33, each construct's CR was much greater than 0.7, which is an indicator of excellent reliabilities of the constructs. Moreover, the AVE of each of the latent constructs was larger than 0.5, which indicates convergent validity on the construct level, and was slightly higher than the largest

shared variances with any other latent variables, which indicates adequate discriminant validity between the constructs according to Hair et al. (2010).

Table 33

AVEs, CRs, and Shared Variances for Each GSBP construct

			Shared Variance		
Factor	AVE	CR	PN	FI	IC
Perceived Norms	0.57	0.92	1		
Feeling Ignored	0.79	0.97	.56	1	
Interpersonal Conflict	0.76	0.94	.37	.55	1

Convergent Validity

For convergent validity on the scale level, constructs similar to GSBP such as social connectedness, belongingness, friendship, and perceived social support should relate to the measure of being phubbed in social interactions. As seen in Table 32, mean GSBP scores modestly correlated with scores on the SCS (r = -.20, p < .001), GBS (r = -.15, p < .01), and FS (r = -.13, p < .05) in expected directions. However, MSPSS scores showed no significant correlation with either GSBP scores (r = -.06, p = .32) or Pphub scores (r = -.06, p = .31).

Criterion-related Validity

To examine the concurrent validity, the correlation coefficient was calculated between the GSBP and the Pphubbing Scale. The total score on the GSBP correlated positively and significantly with the nine-item Partner Phubbing Scale, r = .31, p < .001. A standard multiple regression analysis was conducted with Pphubbing as the criterion

variable and the scores on each GSBP subscale as criterion predictors. The multiple regression model of the GSBP statistically significantly predicted being phubbed by partners, $F(3, 338) = 14.03$, $p < .001$, adj. $R^2 = .10$. However, Feeling Ignored (FI) did not add significance to the regression model (see Table 34 for standardised β values, *t*-test, and *p*-values).

Table 34

Results of Multiple Regression Analysis with GSBP Subscale Scores Predicting the Partner Phubbing Scale Scores

Factor	β	*t*	*p*
Perceived Norms	.25	3.19	< .01
Feeling Ignored	-.06	-.69	.49
Interpersonal Conflict	.18	2.29	< .05

Discussion

The results indicated that the GSBP has acceptable psychometric properties. The results of the CFA suggest that the intended second-order three-factor measurement structure has been retained in the 22-item GSBP. Moreover, the GSBP has all items loaded strongly and significantly on their factors (exceeded .50). The construct reliability, convergent validity, and discriminant validity on the construct level were excellent, as were internal consistency, reliability and concurrent validity on the scale level. However, the convergent validities were unexpectedly low. Only small associations were observed. In this scenario, even though the measures employed in this study were expected to assess a similar construct, it is possible that a novel concept of the experience of being phubbed

differed across those measures. The failure to find strong evidence on convergent validity could be the result of unexpected divergent conceptualisations of the constructs of interest (Antony & Barlow, 2011). The MSPSS scale as a measure of perceived social support comes from several sources, not only conversation partners, but also friends, family, and significant others outside the social interactions. It is possible that even though individuals were phubbed extensively in social interactions, they could still perceive social support from people outside those interactions. Similarly, the modest correlations found between the GSBP and the SCS, the GBS, and the FS scale may represent some overlaps between those constructs. It is possible that the SCS, the GBS, and the FS scale represent social connectedness, belongingness, and social isolation in general, whereas the GSBP only focuses on a specific social interaction. Overall therefore, we are satisfied that the GSBP displays satisfactory concurrent and convergent validities.

Study 10

This study aimed (1) to explore the scale test-retest reliability, and (2) to evaluate the discriminant validity of the GSBP scale. To ensure the establishment of the scale's test-retest reliability the GSBP was administered twice, with a four-week interval. In order to examine the discriminant validities between measures, the GSBP scale was administered to participants alongside the instruments that are assumed to measure different constructs (Widaman et al., 2011). As a result, the Life Orientation Test-Revised (Scheier, Carver, & Bridges, 1994), the Paranoia Scale (Fenigstein & Vanable, 1992), and the Patient Health Questionnaire (Spitzer, Kroenke, Williams, & Patient Health Questionnaire Primary Care Study Group, 1999) were employed in this study. The GSBP scale should measure the true

experience of being phubbed rather than a pessimistic attitude, paranoid thoughts, or negative perceptions that result from depression.

Method

Participants

A total of 228 participants (93 males, 132 females, one transgender, and two participants did not provide gender information) were recruited from the crowdsourcing platform Prolific Academic to complete the questionnaire (Time 1 completion). A subsample of 153 participants (67.11% retention rate) completed the questionnaire in a follow-up measurement, i.e., Time 2. Participants were paid £0.59 for Time 1 completion and an additional £0.17 for Time 2 completion. Participants who took part in previous studies were not able to participate in this study. Ages ranged from 18 to 66 years (M = 34.40, SD = 11.05). Participants were primarily White/Caucasian (87.3%), full-time workers (46.9%), and had college-level education (67.1%). No case with missing value was found.

Procedures and Materials

This study aimed to established test-retest reliabilities and discriminant validities of the instrument. The ICC estimates and their 95% confidence intervals were calculated based on an absolute-agreement and the two-way mixed-effects model. A t-test was also conducted to examine whether there was a statistically significant difference in GSBP scores over the four-week period. In order to examine the discriminant validities between measures, the correlation coefficients were expected to be low and non-significant to moderate ($0 \leq r \leq .6$), indicating a divergent validity of the measures compared (Netemeyer et al., 2003).

The Generic Scale of Being Phubbed (GSBP), the Life Orientation Test-Revised (Scheier et al., 1994), the Paranoia Scale (Fenigstein & Vanable, 1992), and the Patient Health Questionnaire (Spitzer et al., 1999) were employed in this study. Participants were also asked to indicate their age, gender, occupation, education level, and ethnicity. They were then debriefed, thanked, and paid. Test-retest data were collected from participants who completed the questionnaire at Time 1 and Time 2 (n = 153). The GSBP was the only instrument administered at Time 2.

Generic scale of being phubbed. The 22-item GSBP scale developed from Study 8 was used without changes. The internal reliabilities of the GSBP scale in this study were excellent (α range from .92 to .96 for Time 1 and α range from .93 to .96 for Time 2).

Life orientation test revised. The 10-item LOT-R is a revised version of the original LOT scale (Scheier & Carver, 1992). This scale's items were designed to assess optimism versus pessimism such as "I'm always optimistic about my future" and "Overall, I expect more good things to happen to me than bad". Of the 10 items, three items measure optimism, three items measure pessimism, and four items serve as fillers (Scheier et al., 1994). Participants responded on a five-point Likert scale (0 = strongly disagree, 4 = strongly agree; α = .82, M = 6.83, SD = 2.82 for the optimism subscale and α = .84, M = 5.77, SD = 3.03 for the pessimism subscale).

Paranoia scale. The Paranoia scale (PS; Fenigstein & Vanable, 1992) is a 20-item measure of ideas of paranoia for use with a non-clinical population. Individuals were asked to what extent 20 statements characterise them (e.g., "No one really cares much what happens to you" and "I tend to be on my guard with people who are somewhat more friendly than I expected") on a five-point Likert scale ranging from 1, *not at all applicable*

to me, to 5, *extremely applicable to me* (α = .96, *M* = 44.43, *SD* = 18.43). Higher scores indicated greater beliefs and attitudes characteristic of paranoia.

Patient health questionnaire. The nine-item self-administered PHQ-9, rated on a four-point Likert scale (0 = *not at all*, 3 = *nearly every day*; α = .89, *M* = 7.86, *SD* = 6.08), assesses the presence and severity of depression based on the DSM-IV criteria for depression such as "Little interest or pleasure in doing things" and "Feeling down, depressed, or hopeless" in the last two weeks (Spitzer et al., 1999). Higher scores indicate higher severity of depression.

Results

Discriminant Validity

As expected, small to moderate significant correlations were found between the experience of being phubbed, optimism, pessimism, paranoia, and depression. No significant correlation was found between being phubbed and optimism (r = .05, p = .48). Significant moderate correlations were found between being phubbed and pessimism (r = .36, p < .001), between being phubbed and paranoia (r = .53, p < .001), and between being phubbed and depression (r = .36, p < .001). Non-significant to moderate correlations are determined as evidence of discriminant validity (Netemeyer et al., 2003).

Test-retest Reliability

Within the test-retest sample (N = 153), mean GSBP scores at Time 1 (Day 0) and Time 2 (Day 28) were 81.96 (*SD* = 25.18) and 82.36 (*SD* = 26.42), respectively. The intraclass correlation coefficient (ICC) was conducted and showed an excellent degree of reliability index in the test-retest. The average measure ICC of GSBP was .90 with a 95% confidence interval from .86 to .92, $F(152, 152) = 9.53$, p < .001. The Pearson's correlation

and ICC results of each subscale are also shown in Table 35. The correlation between mean GSBP scores at Time 1 and Time 2 was positive and strong ($r = .81$, $p < .001$). Additionally, a paired samples *t*-test was conducted to confirm the scale's test-retest reliability. Results revealed that overall mean GSBP scores and mean scores from each subscale did not change significantly over the four-week interval, as shown in Table 35.

Table 35

Correlations between GSBP (Time 1) and (Time 2), Paired Samples t-test, and ICC Results

	GSBP (Time2)		Paired Samples t-test				Interclass Correlation Coefficients			
GSBP (Time1)	r	p	t	95% CI	p	d	ICC	95% CI	F	p
GSBP	.81	< .001	-.31	-2.94 - 2.14	.76	.03	.90	.86 - .92	9.53	< .001
PN	.77	< .001	.73	-.72 - 1.57	.47	.06	.87	.82 - .91	7.73	< .001
FI	.74	< .001	-.18	-1.30 - 1.08	.85	.01	.85	.80 - .89	6.81	< .001
IC	.73	< .001	-1.60	-1.59 - .17	.11	.13	.84	.79 - .89	6.44	< .001

Note. N = 153. GSBP = Generic Scale of Being Phubbed; PN = Perceived Norms; FI = Feeling Ignored; IC = Interpersonal Conflict.

Discussion

The pattern of non-significant to moderate correlations provides evidence for the discriminant validity of the GSBP scale. In this study, correlations between the experience of being phubbed, pessimism, depression, and paranoia in the moderate range (e.g., $r = .40$ - .60) would indicate that the GSBP is associated with the measure of partly related constructs, while being distinct from them (Wood, Garb, & Nezworski, 2007). Although there are no current theoretical connections or known patterns of correlations among the measures employed in this study, results still showed medium high correlations between the

GSBP and the Paranoia scale. It is possible that someone feeling paranoid could be hypervigilant to potential threats occurring in social interactions. Individuals with a paranoid personality may assume that their conversation partner will harm them or give them the silent treatment, even if there is no evidence to support this speculation. They may suspect, on the basis of little or no evidence, that their conversation partners are phubbing. However, while the moderate correlation between the experience of being phubbed and paranoia may sound questionable, it is still within an acceptable range of correlation coefficient-supported discriminant validity (Netemeyer et al., 2003). Moreover, both results from a paired samples *t*-test and ICC indicated that overall mean scores of the GSBP increased slightly, but that they did not change significantly over the time, which confirmed the scale's test-retest reliability.

In conclusion, the three-factor 22-item Generic Scale of Being Phubbed (GSBP) was developed through Studies 8, 9, and 10. After reducing and refining items with the assistance of expert panels, exploratory and confirmatory factor analyses were conducted to further reduce the number of items and finalise the scales. Finally, the psychometric properties of the GSBP scale were examined. The GSBP scale revealed good construct validities, criterion validities, internal consistency reliabilities, and test-retest reliabilities. It also revealed acceptable convergent validities and discriminant validities. The GSBP scale can therefore be used as a tool to measure the experience of being phubbed in social interaction.

General Discussion

The current chapter developed and validated two novel scales: one measuring phubbing behaviour and the other measuring the experience of being phubbed. Up to this

point, literature lacked scales to measure these two phenomena, which are pervasive features of everyday life. It is important to be able to measure phubbing and the experience of being phubbed, as researchers know very little about how this behaviour influences people's daily communication. Validated, context-free scales will provide the springboard for future studies on this important topic.

To our knowledge, this study is the first to psychometrically develop measurements for these constructs. The GSP and the GSBP represent promising alternatives to existing context-dependent measures of phubbing behaviour and the experience of being phubbed. Studies 5 and 8 identified four facets of phubbing behaviour (nomophobia, interpersonal conflict, self-isolation, and problem acknowledgement) and three facets of being phubbed (perceived norms, feeling ignored, interpersonal conflict) through a series of sequential steps, including item generations and exploratory factor analyses. The previous studies of scale development associated with phubbing and being phubbed did not reveal the existence of these dimensions and only suggested unidimensional structure of scales (Karadağ et al., 2015; Roberts & David, 2016; Roberts & David, 2017).

Studies 6 and 9 confirmed the respective intended four-factor structure of the 15-item GSP and three-factor structure of the 22-item GSBP through confirmatory factor analyses. These findings ensured that each important facet of phubbing behaviour and the experience of being phubbed are comprehensively reflected in both new instruments. The two studies provided evidence of good internal reliability and criterion-related validity for the GSP and GSBP scales. The GSP study also revealed excellent convergent validity. However, the GSBP study revealed weaker evidence of convergent validity. Both scales also revealed excellent reliability, convergent validity, and discriminant validity at the

construct level.

Studies 7 and 10 provided further evidence of the discriminant validity and test-retest reliability of the GSP and GSBP scale, respectively. Results revealed that the GSP construct was independent of unrelated psychological constructs, including introversion, social desirability and schizotypal personality, and that the GSBP construct was partly independent from optimism/pessimism, social paranoia, and depression constructs.

Rather than measuring the exact duration and frequency of phubbing, the GSP measures individuals' general tendency to phub other people, and the GSBP measures the experience of being phubbed during face-to-face social interactions with others. These constructs could be also considered as the mean levels of phubbing or being phubbed over a period of time. The GSP further explores a cognitive response of the phubber to their own phubbing, such as experiencing an emotional reaction if the phone is not nearby. The GSBP not only measures the phubbee's perception of phubbers but also measures the tendency to react to phubbing behaviour. However, the intensity of phubbee's experiences may vary due to various social situations and underlying factors such as subjective perceptions, perceived social norms of phubbing, levels of frustration, and intensity of phubbing.

It is still uncertain whether the constructs of phubbing and being phubbed are best conceptualized as traits or states. Phubbing may show change but also show stability over time. Most psychological constructs are neither absolutely trait-like nor absolutely state-like (Hertzog & Nesselroade, 1987). In this study, without a specific period of time included in the instructions to participants, the GSP and GSBP measures are most likely to be trait-like in terms of measuring general tendencies. Trait-like conceptualisations can be

confirmed with further analyses of the differential stabilities of both measures across longer intervals (e.g. year). With a specific period of time added into the instructions to participants, it is likely that both measures may represent more state-like conceptualisations of phubbing. Thus, further research exploring the conceptualisations underlying both measures is also needed.

It is important to consider some important limitations of these studies. First, because research on phubbing is still in its infancy, new aspects of phubbing might be uncovered in future research that are not included in these scales. It is anticipated that the scales may need to be adapted in future to keep up with developments in literature and technology. However, we also anticipate that the core elements of the scales will remain robust.

While both scales were developed and validated systematically, the tendency may remain for respondents to report the information in a manner that will be viewed favourably by others (Furnham, 1986). Questions related to phubbing behaviour and being phubbed may be viewed as socially sensitive, which can lead to socially desirable responses. The form of over-reporting and under-reporting may also operate in different directions for individuals with different demographic characteristics and perceived social norms of phubbing. Similar to other self-administered questionnaires, it is crucial for researchers to determine strategies focused on mitigating social desirability bias (Nederhof, 1985), such as a separate socially desirable responding measure. Future studies can test whether the self-reported GSP and GSBP are associated with socially desirable responding measures.

Although our previous research revealed that phubbing positively predicts the extent to which people are phubbed (Chotpitayasunondh & Douglas, 2016), we did not employ the

GSP and GSBP together in the same survey. Future studies are therefore encouraged to confirm the relationship between phubbing behaviour and being phubbed. Moreover, we did not test whether phubbing behaviour and being phubbed causes problems to psychosocial functioning or vice versa. These relationships may also be bidirectional and different in more diverse samples. Future longitudinal studies, employing the GSP and the GSBP along with other clinical measures at multiple points in time, would be fruitful in order to investigate whether phubbing behaviour and being phubbed could have a negative impact on physical and mental health or even cause minimal psychosocial functional impairments. This will help us understand more about the development and consequences of phubbing behaviour and being phubbed. Moreover, studies such as this could reveal the proportion of phubbers and phubbees within the general population and the proportion of problematic phubbers and phubbees among them.

In the present chapter, the large sample sizes represent a strength of the thesis and are an asset in providing high statistical power to the analyses. Other strengths of the studies in this chapter are the use of strict statistical procedures to develop and validate the GSP and GSBP. Certain qualities of these two measures make them highly suitable for use by clinicians and researchers alike. Phubbing behaviour and being phubbed are constructs that would be difficult to obtain with behavioural and physiological measures. Compared to behavioural and physiological methods, the GSP and GSBP will save time and costs for researchers when obtaining data. They can also be easily implemented in large samples, especially with the advent of online surveys. With their strong psychometrics, validity, and reliability the GSP and GSBP may prove to be useful indicators of an individual's phubbing behaviour and the experience of being phubbed. The GSBP is generic rather than specific

(i.e., does not focus on the situation in which a person is phubbed). Therefore, the GSBP may be more in sync with routine phubbing patterns in daily life. The GSP precisely grasps the dimensions of true phubbing behaviour, rather than smartphone addiction symptoms or other non-phubbing behaviours. This phubbing behaviour should be considered as a separate entity from problematic mobile phone use. However, we suppose that phubbing behaviour and problematic mobile phone use might not be completely independent from each other. Indeed, those who use mobile phones excessively might more easily become problematic phubbers (Chotpitayasunondh & Douglas, 2016). This remains another open question for future research.

Chapter 6: Implications, Limitations, and Future Directions

Abstract

In this final chapter, we summarise our findings, demonstrate some theoretical and practical implications of the research, and outline some general limitations. This chapter also introduces some promising avenues worthy of further research on phubbing, including the use of the phubbing animation paradigm, further development of the Phubbing Model, and further investigation of the relationship-moderated effects of phubbing in different social contexts. We also discuss the benefits of having developed psychometrically sound measures of phubbing. Furthermore, we highlight how these potential avenues for future directions provide many opportunities to contribute to communication theory and social psychological theory.

Smartphones have changed the way people interact with each other (Alter, 2017; Islam & Want, 2014). A significant portion of the world's population uses smartphones to conduct their everyday lives, and more than five billion people around the world are now smartphone users (Sivakumaran & Iacopino, 2018). Many people simply cannot live without them. As smartphones are becoming more integrated into human life, it is increasingly important for researchers to consider their impact on the quality of social life. Throughout the present thesis, we have studied the way people often ignore others in favour of their smartphones. This phenomenon, known as *phubbing*, seems to detract from rather than enhance social interactions (e.g., Chotpitayasunondh & Douglas, 2018; Hales et al., 2018; Kadylak et al., 2018; Roberts & David, 2016). This thesis presented evidence that many psychological predictors have an influence on phubbing behaviour and the experience of being phubbed (Chotpitayasunondh & Douglas, 2016). This research also showed that the experience being phubbed is similar to being ostracised, which leads to a variety of negative effects on basic human needs, affect, and social relationships (Chotpitayasunondh & Douglas, 2018). Moreover, phubbing affects phubbees in the same way, regardless of whether the phubbers are liked or disliked. However, despite all of these negative consequences, phubbing seems to have become normative behaviour (Chotpitayasunondh & Douglas, 2016).

Study 1 is the first to consider both the antecedents and consequences of phubbing behaviour. It is also the first to consider how phubbing may have become such a pervasive norm in modern communication. This study offers more insight into the potential causes of phubbing behaviour, and what some of the effects of phubbing might be. Recent studies have extended on our findings. For example, one recent study on youth in an Indian

college re-examined our phubbing antecedents and supported our results by revealing the strong significant effects of potential predictors (Internet addiction, smartphone addiction, fear of missing out, and self-control) on the act of phubbing with large effect sizes (Davey et al., 2018). Another recent study extended our knowledge of the antecedent of phubbing by demonstrating that the trait 'fear of missing out' is indirectly associated with phubbing behaviour via the state of 'fear of missing out' (Balta, Emirtekin, Kircaburun, & Griffiths, 2018). However, there is still much to be discovered regarding the predictors and effects of phubbing.

Study 2 broke new ground by demonstrating that phubbing violates fundamental human needs, and reduces positive but increases negative affect. Specifically, a sense of belonging, and both positive and negative affect mediate the effect of phubbing on communication outcomes. This study extended upon research on the antecedents and consequences of phubbing (Chotpitayasunondh & Douglas, 2016) by further highlighting some of the potentially negative consequences of mobile phone use on social interactions. The study makes an important contribution to the literature on ostracism in modern society, and we anticipate this to be a fruitful line of research as scholars further investigate the effects of modern technologies on social life. Other research has also provided support for our results that phubbing can be experienced as ostracism by the interaction partner, which in turn leads to decreased basic needs satisfaction and an increased level of pain (Hales et al., 2018).

Studies 3 and 4 focused on the replication and extension of our previous study to consider how interpersonal relationship status influences the experience of being phubbed, more specifically how people judge the quality of the interaction affected by phubbing and

how they feel about the phubber. It extended research on the effects of phubbing on social interaction by further investigating the moderating effect of interpersonal relationship status on the reflexive effects of phubbing. It is therefore the first to suggest that the effects of phubbing do not depend on the relationship between the phubber and phubbee.

Studies 5 to 10 developed the four-factor 15-item GSP and the three-factor 22-item GSBP. After reducing and refining items with the assistance of expert panels, EFA and CFA were conducted to further reduce the number of items and finalise the scales. Finally, the psychometric properties of the GSP scale and the GSBP scale were examined. The GSP scale revealed good construct validities, criterion validities, convergent validities, discriminant validities, internal consistency reliabilities, and test-retest reliabilities. The GSP scale can therefore be used as a tool to measure the unique behaviour of phubbing in social interaction. The GSBP scale revealed good construct validities, criterion validities, internal consistency reliabilities, and test-retest reliabilities. It also revealed acceptable convergent validities and discriminant validities. The GSBP scale can therefore be used as a tool to measure the experience of being phubbed in social interaction. Thus, we expect that these two measures will be translated into many languages in the future.

Overall, the present thesis provides a comprehensive look at the modern phenomenon of phubbing: what causes it, how people experience it, and what effects it has on social life. We also demonstrated how phubbing and the experience of being phubbed can be measured. Theoretically, this research is closely linked to the ostracism literature, more broadly connecting the new phenomenon of phubbing with existing research, models, and theorising in social psychology. In summary, the current research opens up a new line

of study that is ripe for future development. As communication technology continues to evolve, it is vital to understand its impacts on social life.

Implications

Theoretical Implications

Our results suggest that the key predictors of problematic Internet use – derived from theoretical perspectives and empirical research on Internet addition – also predict problematic smartphone use (Billieux et al., 2014; U. Lee et al., 2014; Y. Lee et al., 2014; Y. H. Lin et al., 2014) and this in turn predicts a behaviour that is likely to be detrimental to everyday social interactions. Indeed, smartphones have a wider variety of functions and applications than ordinary cell phones (Falaki et al., 2010). This multi-functional improvement may therefore alter the definition of smartphone addiction from previous conceptualisations (Takao et al., 2009). In particular, it is now more important to focus on Internet-based activities rather than on normal cell phone use when taking into account the behaviours that people engage in when using mobile phone technology (Kwon et al., 2013). Ongoing theoretical developments explaining Internet behaviour are also therefore likely to explain changes in smartphone behaviour.

However, our research goes further to develop a theoretical account of why phubbing has become normative. It suggests that phubbing may have become the norm as a result of both observed and personal behaviour. People are phubbed, but they are also phubbers. In an environment where people are constantly switching between being the protagonists and recipients of this behaviour, our data suggest that phubbing is coming to be regarded as the norm. This may in part occur because personal behaviours, beliefs, and attitudes can often lead to false-consensus effects, i.e., that individuals assume that others

think and do the same as they themselves (Berkowitz, 2005; Marks & Miller, 1987; Ross, Greene, & House, 1977). People may therefore assume that others phub in the same way as they do, therefore perpetuating the behaviour. Furthermore, when people experience phubbing, and frequently notice it occurring around them, they may be likely to conclude that this behaviour is socially acceptable (Ross, 1977). Our study shows a significant relationship between these two determinants, namely that phubbing positively predicts the extent to which people are phubbed. Moreover, the rule of reciprocity can be assumed as a strong determining factor that turns a phubber into a phubbee. People tend to commit retaliatory behaviour in response to discontent (Falk & Fischbacher, 2006; Keysar et al., 2008). In fact, observational research in public areas also finds evidence of cell phone-contagion: when one person uses a cell phone, their companion is likely to do so shortly thereafter (Finkel & Kruger, 2012). Snubbing companions by smartphone may therefore cause phubbing behaviours to be reciprocated.

Furthermore, we explored the moderating effect of gender on each part of our model. It shows that the extent to which males are phubbed tends to be the main predictor of perceived social norms of phubbing in men, whereas the extent to which females phub their companions tends to be the main predictor in women. This can perhaps be explained by subjective motivations and communication differences between women and men. Research suggests that males see smartphones as empowering devices with instrumental functions, while females use smartphones as facilitators of social interaction (Baron & Campbell, 2012; Geser, 2006). As a social activity, phubbing is perhaps therefore more predictive of perceived normative behaviour in males; as they engage in phubbing less than women, norms are more informed by observing others' behaviour rather than their own.

This study also makes an important contribution to the literature on social ostracism and interpersonal relationships. It shows that threats to fundamental needs can occur as a result of an everyday communication phenomenon that a significant majority of people report having experienced (Chotpitayasunondh & Douglas, 2016). Traditionally, the effects of social exclusion have been studied in games such as the cyberball paradigm (Hartgerink et al., 2015). However, as people become more and more reliant on their smartphones, social exclusion has perhaps become a pervasive feature of everyday social interaction. Unlike other more well-studied forms of social exclusion, phubbing can take place anywhere and at any time, as someone reaches for their phone and ignores their conversation partner. People may therefore feel their fundamental needs to be more regularly threatened during routine, everyday conversations, providing new avenues for research on ostracism. To date research has revealed negative effects of phubbing on psychological wellbeing, such as a decreased feeling of relational evaluation (Hales et al., 2018), less social wellbeing (Davey et al., 2018), less enjoyment from real-world social interactions (Dwyer, Kushlev, & Dunn, 2017), heightened feelings of jealousy (Krasnova et al, 2016), violation of expected and appropriate phone etiquette and manners (Kadylak et al., 2018), and dampened mood (Chotpitayasunondh & Douglas, 2018). Importantly, it has also been shown that increased phubbing significantly and negatively affects perceived communication quality (Abeele et al., 2016; Chotpitayasunondh & Douglas, 2018; Kadylak et al., 2018) and relationship satisfaction (Chotpitayasunondh & Douglas, 2018; Devey et al., 2018; McDaniel, Galovan, Cravens, & Drouin , 2018; Roberts & David, 2016).

Results from our studies further demonstrated that the awareness of the immediate flash of negativity produced by the experience of being phubbed can be sufficient to elicit a

reflexive and undifferentiated psychological response to rejection, regardless of source. These findings are consistent with Gonsalkorale and Williams' (2007) research, which revealed that ostracism by an undesirable person may be as distressing as ostracism by a valued person. It is possible that the implications of rejection in being phubbed by a conversation partner are so profound that individuals will show consistent reactions, regardless of the relationship to their conversation partners (Gonsalkorale & Williams; 2007; Wirth & Williams, 2009). Moreover, the human cognitive system is highly sensitive to the many types of social rejection (Williams, 2007), which could lead to an immediate and profound impact of phubbing, regardless of perpetrator. The effect of phubbing on interaction outcome may be equally strong for friends and enemies; a phubbee whose friendships are affected and thus experiences ostracism may be unable to form new bonds, or even form a bad first impression about the conversation partner (Carney, Colvin, & Hall, 2007). More secure relations may also be affected by partner ostracism, as they have more relationship capital to lose if they are ignored by their partners (Forgas & Fitness, 2008). However, the effect of phubbing may also be equally weak for friends and enemies. A phubbee may have no expectation at all of an enemy's behaviour during a conversation, while being able to foresee a friend's phubbing behaviour. Both situations may prevent any harm from the phubbing (Abeele et al., 2016). This lack of moderation by relationship status is consistent with the typical unmoderated reflexive effects in both phubbing literature (Hales et al. 2018) and ostracism literature (e.g., Gonsalkorale & Williams, 2007).

Practical Implications

Next to the contribution to theory development in the field of phubbing, this thesis also has practical implications. By identifying the factors that predict smartphone

addiction, the current thesis can contribute to the assessment of problematic smartphone behaviour and interventions to deal with this. More novel, however, is our finding that problematic smartphone use is a predictor of phubbing. By identifying phubbing as a key outcome, practitioners may use phubbing behaviour as a measure of the success of interventions targeted at problematic smartphone use. The results of this thesis also allow us to better understand how problematic smartphone use has become acceptable or normative. Efforts to address problematic smartphone use may therefore benefit from considering the role of norm development, and how norms can be both informed by and simultaneously fuel behaviour. These findings also raise awareness about the etiquette associated with smartphone use compared to other domains, and how the expectations of communicators may change as technology develops further.

Social interaction between friends provides undeniable benefits, but putting phubbing into this equation can have serious drawbacks. As smartphones have become an indispensable part of daily life, there may be times where unintentional phubbing is unavoidable. Individuals should be aware of the effect of phubbing and understand that seemingly harmless smartphone behaviour may lead their friends to feel excluded, which in turn hurts their feelings and basic needs and the overall social interaction. Therefore, it is important to understand how phubbing permeates and affects our society so that people can take the necessary crucial steps to mitigate the potential negative consequences of phubbing, which will soon involve most of the world's population. In particular, emerging findings on the effects of phubbing and the mechanisms that drive these effects may inform interventions to address the negative effects of phubbing. Moreover, the effects of being phubbed by a best friend are quite similar to being phubbed by a worst enemy. Everyone

has to interact with someone they dislike every once in a while, but they can prevent further damage being done to their relationship by control phubbing habits during their interactions.

This thesis contributed a novel method for studying social exclusion in dyadic conversations by using animations in Studies 2, 3, and 4. We know from previous experiments using the cyberball paradigm that socially excluded participants experience a negative impact on fundamental needs, affect, and various other constructs (Hartgerink et al., 2015). In particular, individuals have an automatic mechanism for detecting social ostracism (Panksepp, 2003) and the ostracisers do not even need to be real humans for targets to have reflexive responses (Zadro et al., 2004). The current method therefore offers an additional controlled way of studying social exclusion. A further advantage is that the animations can also be easily adapted to study the effects of varying degrees of phubbing, as well as features of the communication protagonists and features of the communicative context. They are therefore easily adaptable to different research purposes.

This thesis also systematically developed two unique measures: one to examine the behaviour of phubbing, and another to measure the experience of being on the receiving end of phubbing. Both are important constructs to know more about in an age where people are rarely separated from their mobile phones. From a practical perspective, the GSP and GSBP measures provide a foundation for building future knowledge of phubbing behaviour and the experience of being phubbed, and extending the theoretical understanding of the phubbing phenomenon. The GSP and GSBP are easy to use and administer to large groups of participants. Researchers may find these scales particularly useful in psychology, epidemiology, population surveys, technology and communication

surveys, or in social interaction evaluation studies where it is necessary to measure phubbing behaviour and the experience of being phubbed. In particular, the GSP and GSBP may help researchers to explore undiscovered psychological factors related to phubbing phenomena, to study phubbing in at-risk populations, or to study the prevalence of phubbing within specific communities. The scales may also provide information to help reduce phubbing and improve social interactions between individuals and groups.

Limitations and Future Directions

Some limitations should be considered when interpreting the results of this thesis. Although the employed animations were designed to manipulate phubbing, their use comes with some limitations. For example, while they ensure a rigorous level of experimental control, this may come at the cost of external validity. The animations presented cartoon-like figures on a screen (see Figure 4) and are therefore limited in the extent to which they offer the opportunity to study real-life conversations between strangers, acquaintances and friends. It is also possible that the mere presence of smartphones in our animations may act as an environmental distraction and interfere with the true effect of phubbing on interaction outcomes (Misra et al., 2014). However, another recent study found that the mere presence of phones did not significantly influence relational quality for the interaction partner. It may be that the presence of smartphones during interactions is becoming more acceptable as conversational norms evolve (Crowley, Allred, Follon, & Volkmer, 2018). Moreover, we controlled this possible confounding factor in our animations by presenting smartphones across all phubbing conditions. Thus, the efficiency, context specificity, and strengths of our animations should be investigated further.

The accuracy of self-administered questionnaires from our online surveys may be marred by participants' cognitive biases, including social desirability response bias. Survey respondents might not respond truthfully about phubbing but simply answer questions in a manner that would make them look good (Furnham, 1986; Nederhof, 1985). This bias might have been an issue when the scope of our online surveys involved socially sensitive issues, including mobile phone etiquette and phubbing behaviour. While there is also a possibility of socially desirable responding, the use of self-administered questionnaires answered in private can reduce the salience of social cues by isolating respondents, which in turn reduces the possibility of socially desirable responding (Nederhof, 1985). However, such methods of minimising social desirability biases cannot completely solve the problem, and a combination of several prevention methods needs to be considered in future research. Moreover, our self-reported GSP and GSBP may be also viewed as socially sensitive questions, which can lead to socially desirable bias in respondents. Future studies are therefore encouraged to test the relationship between our measures and socially desirable responses.

Another limitation of this thesis is that we only emphasised short-term reactions to phubbing. To understand coping and longer-term responses, we need to examine the temporal need-threat model proposed by Williams (2009b) in more detail. This model suggests three stages of the ostracism effect: (1) a reflexive (or immediate) stage, (2) a reflective (or coping) stage, and (3) a resignation (or long-term) stage (Williams, 2009a). In the current thesis, we limited ourselves to examining only the initial and immediate responses to being phubbed (i.e., the reflexive stage). In a recent meta-analysis, the potential ostracism effect measured immediately after the ostracism episode revealed an

effect that was larger than in the later stages. Individuals may recover from the negative consequences of being ostracised after some time (Hartgerink et al., 2015). Future research should therefore investigate what happens in the second and third phases of ostracism as a result of phubbing behaviour. For example, it is interesting to note that the majority of our participants who failed the attention checks were in the extensive phubbing condition, suggesting that people may 'tune out' after some time of being phubbed. Studying the reflective stage will enable researchers to more fully understand the longer-term effects of phubbing. Moreover, longitudinal studies in which the nature of phubbing behaviour in routine communication is tracked over time would further inform researchers about the potential consequences of phubbing.

Future research should also examine additional mechanisms to explain the effects of phubbing on relationship outcomes. We focused on ostracism in the present study, and our findings do support the assumption that phubbing threatens at least one of the fundamental needs and also dampens mood. However, another recent investigation proposed and found evidence to support the idea that mobile phone use during face-to-face interactions influences impression formation as a result of conversational norm violation (Abeele et al., 2016). Thus, further research exploring the mechanisms underlying phubbing effects is also needed. Future research should also consider more naturalistic communication settings to increase external validity, actual behaviours of participants on the receiving end of phubbing (e.g., nonverbal responses, eye tracking responses), and the extent to which social exclusion in the form of phubbing produces different outcomes to other types of social exclusion, such as cyberostracism.

Future research should also examine relationship-moderated effects of phubbing in various interpersonal contexts. The current study revealed that relationship status between phubber and phubbee, which is highly permeable, appeared not to moderate the effects of phubbing on individuals' fundamental human needs, affect, and interaction outcomes. Unlike statuses that are based on such relatively arbitrary preferences (i.e., 'friendship'), more obvious distinctions (e.g., race and gender) seem more likely to moderate the experience of rejection and elicit stronger responses. For example, different-race social rejections were more detrimental than same-race social rejections among undergraduate students, regardless of the interaction partners' ethnicity (Mendes, Major, McCoy, & Blascovich, 2008). Moreover, in the cyberball experiment, participants who attributed ostracism to a permanent group membership (i.e., gender) recovered from social rejection slower than participants attributing ostracism to a temporary team membership (Wirth & Williams, 2009). Future research may attempt to study the effects of these factors to better determine the moderating effect of relationship status on the impact of phubbing. It is also important to study relationship-moderated effects of phubbing in different societies and cultures. Compared to people from individualistic cultural backgrounds, those from collectivist cultures, who have more stable and exclusive social bonds, tend to make clearer distinctions between ingroup and outgroup membership status (Uskul & Over, 2017; Yuki & Schug, 2012). Individuals from collectivistic societies might less bothered by phubbing than individualists, and only be affected when being phubbed by people who possess strong bonds with them (Pfundmair et al., 2015). Conversely, given that their locus of self resides more extensively in the social situation, they might experience phubbing as more of an

injury to the self. Future research may also attempt to replicate our research in different cultural settings.

Further research is required to establish the potential different meanings of smartphones and phubbing behaviour to women and men. In a more equally distributed sample, we could not only have considered our proposed model, but also gender-specific models of how phubbing becomes the norm for each gender. Age differences are also likely to be important. Age differences are well established in other communication domains such as phone manner (Turner, Love, & Howell, 2008) and the use of mobile phones while driving (Lipscomb, Totten, Cook, & Lesch, 2007). Adolescents and young adults in their late teens to mid-twenties may be able to withstand the tense atmosphere of active phubbing and continue their interaction as usual. Younger people tend to report more involvement with their mobile phones (Walsh, White, Cox, & Young, 2011), and less likely to become annoyed by others' mobile phone behaviour (Turner et al., 2008). Moreover, significant others can affect young people's perceptions of their public mobile phone use (Srivastra, 2005; Walsh et al., 2011). In addition, older people tend to view others' smartphone behaviour as more negative when compared to their own (Hakoama & Hakoyama, 2012). Further studies should therefore take account of the influence of age on the phenomena examined in this thesis. It is also important to study the relationship-moderated effects of phubbing in different age groups.

A final future research avenue lies in the use of the GSP and GSBP to facilitate and advance our understanding of phubbing. The GSP and GSBP scales developed and validated in Studies 5 to 10 may be useful additions to studies of mobile phone and daily face-to-face interaction, and act as covariates to broaden our understanding of how

individuals respond to their communication partners when mobile phones interfere with their social interactions, and even threaten their fundamental needs (Chotpitayasunondh & Douglas, 2018). Such work may ultimately contribute to the advancement of theory regarding technology-related ostracism and the consequences of phubbing. Since phubbees might be aware of the reasons behind being phubbed, future studies should also focus on potential motives that phubbees could attribute to phubbers. We hope that these two measures will facilitate the advancement of scientific knowledge concerning these two phenomena, and increase our understanding of how mobile phone use influences people's social interactions and relationships. Moreover, developing multiple language versions of these two measures that are conceptually equivalent in each of the cultures will accommodate a growth in multicultural research on phubbing. Cross-cultural study will help us to understand how cultural differences and similarities can influence phubbing behaviour and the experience of being phubbed.

Conclusions

This thesis provides a unique contribution to knowledge concerning the causes and consequences of phubbing behaviour – the act of snubbing someone in a social setting by concentrating on one's mobile phone. It also provides two new scales to measure phubbing behaviour and the experience of being phubbed. Perhaps the most important outcome of the present thesis is that is demonstrates the negative impact of mobile phone use on human face-to-face interactions. It is becoming clear that people need to find a balance between how much they use smartphones to facilitate their personal connections, and how much they allow smartphones to intrude into their face-to-face interactions.

Although the psychological study of phubbing is very much in its infancy, this thesis linked phubbing to a rich theoretical literature on ostracism. Phubbing adversely affects people in the same ways as more traditional forms of social exclusion. We believe that new knowledge and insight from our research will generate future ideas, pave the way for future exploration, and help eventually establish a rich theoretical literature on phubbing.

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Appendix A: Phubbing Questionnaire (Study 1)

1. How often do you think you phub?

(1) never

(2) less often

(3) once weekly

(4) 2 times or more per week

(5) once daily

(6) 2-3 times per day

(7) 4-5 times per day

(8) 6-9 times per day

(9) 10 times or more per day

2. In total, approximately how much time do you think you spend phubbing per day (on average)?

(1) less than 15 min

(2) 15-30 min

(3) 30-60 min

(4) 60-90 min

(5) 90-120 min

(6) 2-3 h

(7) 4-6 h

(8) more than 6 h

3. How often are you phubbed?

(1) never

(2) less often

(3) once weekly

(4) 2 times or more per week

(5) once daily

(6) 2-3 times per day

(7) 4-5 times per day

(8) 6-9 times per day

(9) 10 times or more per day

4. In total, approximately how much time are you phubbed by others per day (on average)?

(1) less than 15 min

(2) 15-30 min

(3) 30-60 min

(4) 60-90 min

(5) 90-120 min

(6) 2-3 h

(7) 4-6 h

(8) more than 6 h

Appendix B: Perceived Social Norms of Phubbing scale (Studies 1 and 2)

"Phubbing" is a term coined as part of a campaign by the Macquarie Dictionary in May 2012 to describe the act of snubbing someone in a social setting by using your phone instead of talking to the person directly in your company. In other words, phubbing involves using a smartphone in a social setting, and interacting with the smartphone rather than the person or people present.

Not at all *A little* *Somewhat* *Quite a bit* *Very much*

1. Are you familiar with this type of situation?
2. Do you think that people recognise phubbing behaviour?
3. Do you think that phubbing behaviour typical among people around you?
4. Do you think that phubbing behaviour is appropriate?
5. Do you think that other people view phubbing behaviour as appropriate?

Appendix C: Smartphone Addiction Scale - Short Version (Study 1)

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

Strongly disagree	*Disagree*	*Somewhat disagree*	*Somewhat agree*	*Agree*	*Strongly agree*

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

Appendix D: Internet Addiction Test (Study 1)

Using the scale provided please indicate how true each statement is of your general experiences. Please answer according to what really reflects your experiences rather than what you think your experiences should be. Please treat each item separately from every other item.

Rarely *Occasionally* *Frequently* *Often* *Always*

1. How often do you find that you stay online longer than you intended?
2. How often do you neglect household chores to spend more time online?
3. How often do you prefer the excitement of the Internet to intimacy with your partner?
4. How often do you form new relationships with fellow online users?
5. How often do others in your life complain to you about the amount of time you spend online?
6. How often do your grades or school work suffer because of the amount of time you spend online?
7. How often do you check your e-mail before something else that you need to do?
8. How often does your job performance or productivity suffer because of the Internet?
9. How often do you become defensive or secretive when anyone asks you what you do online?
10. How often do you block out disturbing thoughts about your life with soothing thoughts of the Internet?
11. How often do you find yourself anticipating when you will go online again?

12. How often do you fear that life without the Internet would be boring, empty, and joyless?

13. How often do you snap, yell, or act annoyed if someone bothers you while you are online?

14. How often do you lose sleep due to late-night log-ins?

15. How often do you feel preoccupied with the Internet when offline, or fantasise about being online?

16. How often do you find yourself saying "just a few more minutes" when online?

17. How often do you try to cut down the amount of time you spend online and fail?

18. How often do you try to hide how long you've been online?

19. How often do you choose to spend more time online over going out with others?

20. How often do you feel depressed, moody, or nervous when you are offline, which goes away once you are back online?

Appendix E: Fear of Missing Out Scale (Study 1)

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

Not at all true of me	*Slightly true of me*	*Moderately true of me*	*Very true of me*	*Extremely true of me*

1. I fear others have more rewarding experiences than me
2. I fear my friends have more rewarding experiences than me
3. I get worried when I find out my friends are having fun without me
4. I get anxious when I don't know what my friends are up to
5. It is important that I understand my friends "in jokes"
6. Sometimes, I wonder if I spend too much time keeping up with what is going on.
7. It bothers me when I miss an opportunity to meet up with friends
8. When I have a good time it is important for me to share the details online (e.g., updating status)
9. When I miss out on a planned get-together it bothers me
10. When I go on vacation, I continue to keep tabs on what my friends are doing

Appendix F: Brief Self-Control Scale (Study 1)

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

Not at all like me	*Not like me*	*Neutral*	*Like me*	*Very much like me*

1. I am good at resisting temptation
2. I have a hard time breaking bad habits
3. I am lazy
4. I say inappropriate things
5. I do certain things that are bad for me, if they are fun
6. I refuse things that are bad for me
7. I wish I had more self-discipline
8. People would say that I have iron self- discipline
9. Pleasure and fun sometimes keep me from getting work done
10. I have trouble concentrating
11. I am able to work effectively toward long-term goals
12. Sometimes I can’t stop myself from doing something, even if I know it is wrong
13. I often act without thinking through all the alternatives

Appendix G: The Need-Threat Measure (Studies 2-4)

Thinking about the conversation in the video, answer the questions below.

This scale consists of a number of words that describe different feeling and emotions. Read each item and then select the appropriate answer in each case.

Not at all A little *Moderately* *Quite a bit* *Extremely*

1. I felt "disconnected"
2. I felt rejected
3. I felt like an outsider
4. I felt that I belonged to the conversation
5. I felt that the conversation partner interacted with me a lot
6. I felt good about myself
7. My self-esteem was high
8. I felt liked
9. I felt insecure
10. I felt satisfied
11. I felt invisible
12. I felt meaningless
13. I felt nonexistent
14. I felt important
15. I felt useful
16. I felt powerful
17. I felt that I had control over the course of the conversation

18. I felt that I had the ability to significantly alter events

19. I felt that I was unable to influence the actions of conversation partner

20. I felt that my conversation partner decided everything

Appendix H: Positive and Negative Affect Schedule (Studies 2-4)

This scale consists of a number of words that describe different feeling and emotions. Read each item and then choose the appropriate answer.

Indicate to what extent you felt this way during the conversation in the video.

Not at all A little *Moderately* *Quite a bit* *Extremely*

1. Interested
2. Distressed
3. Excited
4. Upset
5. Strong
6. Guilty
7. Scared
8. Hostile
9. Enthusiastic
10. Proud
11. Irritable
12. Alert
13. Ashamed
14. Inspired
15. Nervous
16. Determined
17. Attentive

18. Jittery
19. Active
20. Afraid

Appendix I: Iowa Communication Record (Studies 2-4)

Thinking about the conversation in the video, how would you describe the communication between the two of you?

Relaxed	O	O	O	O	O	O	O	Strained
Impersonal	O	O	O	O	O	O	O	Personal
Attentive	O	O	O	O	O	O	O	Poor Listening
Formal	O	O	O	O	O	O	O	Informal
In-Depth	O	O	O	O	O	O	O	Superficial
Smooth	O	O	O	O	O	O	O	Difficult
Guarded	O	O	O	O	O	O	O	Open
Great deal of Understanding	O	O	O	O	O	O	O	Great deal of Misunderstanding
Free of Communication Breakdowns	O	O	O	O	O	O	O	Laden with Communication Breakdowns
Free of Conflict	O	O	O	O	O	O	O	Laden with Conflict
Enjoyable	O	O	O	O	O	O	O	Not Enjoyable
High Quality	O	O	O	O	O	O	O	Low Quality

Appendix J: Relationship Assessment Scale (Studies 2-4)

Thinking about the conversation in the video, answer each of the questions below.

Not at all				*Very much*
1	*2*	*3*	*4*	5

1. How well did your conversation partner meet your needs?

2. In general, how satisfied were you with the conversation?

3. Was this conversation good compared to most?

4. How much do you wish you hadn't gotten into this conversation?

5. To what extent did the conversation meet your original expectations?

6. How much did you like your conversation partner?

7. To what extent were there problems in this conversation?

Appendix K: Adult Rejection Sensitivity Questionnaire (Study 2)

Below is a collection of situations in which people ask things of others.

For each item, imagine that you are in the situation, and then answer the questions (a) and (b) that follow it.

1. You ask your parents or another family member for a loan to help you through a difficult financial time.

1a. How concerned or anxious would you be over whether or not your family would want to help you?

Very unconcerned	*Unconcerned*	*Slightly unconcerned*	*Slightly concerned*	*Concerned*	*Very concerned*

1b. I would expect that they would agree to help as much as they can.

Very unlikely	*Unlikely*	*Slightly unlikely*	*Slightly likely*	*Likely*	*Very likely*

2. You approach a close friend to talk after doing or saying something that seriously upset him/her.

2a. How concerned or anxious would you be over whether or not your friend would want to talk with you?

Very unconcerned	*Unconcerned*	*Slightly unconcerned*	*Slightly concerned*	*Concerned*	*Very concerned*

2b. I would expect that he/she would want to talk with me to try to work things out.

Very unlikely	*Unlikely*	*Slightly unlikely*	*Slightly likely*	*Likely*	*Very likely*

3. You bring up the issue of sexual protection with your significant other and tell him/her how important you think it is.

3a. How concerned or anxious would you be over his/her reaction?

Very unconcerned	*Unconcerned*	*Slightly unconcerned*	*Slightly concerned*	*Concerned*	*Very concerned*

3b. I would expect that he/she would be willing to discuss our possible options without getting defensive.

Very unlikely	*Unlikely*	*Slightly unlikely*	*Slightly likely*	*Likely*	*Very likely*

4. You ask your supervisor for help with a problem you have been having at work.

4a. How concerned or anxious would you be over whether or not the person would want to help you?

Very unconcerned	*Unconcerned*	*Slightly unconcerned*	*Slightly concerned*	*Concerned*	*Very concerned*

4b. I would expect that he/she would want to try to help me out.

Very unlikely	*Unlikely*	*Slightly unlikely*	*Slightly likely*	*Likely*	*Very likely*

5. After a bitter argument, you call or approach your significant other because you want to make up.

5a. How concerned or anxious would you be over whether or not your significant other would want to make up with you?

Very unconcerned	*Unconcerned*	*Slightly unconcerned*	*Slightly concerned*	*Concerned*	*Very concerned*

5b. I would expect that he/she would be at least as eager to make up as I would be.

Very unlikely	*Unlikely*	*Slightly unlikely*	*Slightly likely*	*Likely*	*Very likely*

6. You ask your parents or other family members to come to an occasion important to you.

6a. How concerned or anxious would you be over whether or not they would want to come?

Very unconcerned	*Unconcerned*	*Slightly unconcerned*	*Slightly concerned*	*Concerned*	*Very concerned*

6b. I would expect that they would want to come.

Very unlikely	*Unlikely*	*Slightly unlikely*	*Slightly likely*	*Likely*	*Very likely*

7. At a party, you notice someone on the other side of the room that you'd like to get to know, and you approach him or her to try to start a conversation.

7a. How concerned or anxious would you be over whether or not the person would want to talk with you?

Very unconcerned	*Unconcerned*	*Slightly unconcerned*	*Slightly concerned*	*Concerned*	*Very concerned*

7b. I would expect that he/she would want to talk with me.

Very unlikely	*Unlikely*	*Slightly unlikely*	*Slightly likely*	*Likely*	*Very likely*

8. Lately you've been noticing some distance between yourself and your significant other, and you ask him/her if there is something wrong.

8a. How concerned or anxious would you be over whether or not he/she still loves you and wants to be with you?

Very unconcerned	*Unconcerned*	*Slightly unconcerned*	*Slightly concerned*	*Concerned*	*Very concerned*

8b. I would expect that he/she will show sincere love and commitment to our relationship no matter what else may be going on.

Very unlikely	*Unlikely*	*Slightly unlikely*	*Slightly likely*	*Likely*	*Very likely*

9. You call a friend when there is something on your mind that you feel you really need to talk about.

9a. How concerned or anxious would you be over whether or not your friend would want to listen?

Very unconcerned	*Unconcerned*	*Slightly unconcerned*	*Slightly concerned*	*Concerned*	*Very concerned*

9b. I would expect that he/she would listen and support me.

Very unlikely	*Unlikely*	*Slightly unlikely*	*Slightly likely*	*Likely*	*Very likely*

Appendix L: Phubbing Animation Manipulation Check (Studies 2-4)

1. What is on the table?

    (1) Cake

    (2) Bottle of water

    (3) Books

    (4) Flower

2. What colour is your conversation partner's shirt?

    (1) Black

    (2) White

    (3) Blue

    (4) Red

Appendix M: Generic Scale of Phubbing (Studies 5-7)

We would like you to think about your mobile phone use during your face-to-face social interactions with others. Think about your social interactions on the whole (e.g., with friends, acquaintances, family, your partner) and the extent to which the following statements apply to you. In my face-to-face social interactions with others ….

Never	*Rarely*	*Occasionally*	*Sometimes*	*Frequently*	*Usually*	*Always*
1	*2*	*3*	*4*	*5*	*6*	*7*

1. I feel anxious if my phone is not nearby
2. I cannot stand leaving my phone alone
3. I place my phone where I can see it
4. I worry that I will miss something important if I do not check my phone
5. I have conflicts with others because I am using my phone
6. People tell me that I interact with my phone too much
7. I get irritated if others ask me to get off my phone and talk to them
8. I use my phone even though I know it irritates others
9. I would rather pay attention to my phone than talk to others
10. I feel content when I am paying attention to my phone instead of others
11. I feel good when I stop focusing on others and pay attention to my phone instead
12. I get rid of stress by ignoring others and paying attention to my phone instead
13. I pay attention to my phone for longer than I intend to do so
14. I know that I must miss opportunities to talk to others because I am using my phone
15. I find myself thinking “just a few more minutes” when I am using my phone

Appendix N: Generic Scale of Being Phubbed (Studies 8-10)

We would like you to think about others' mobile phone use during your face-to-face social interactions with others. Think about your social interactions on the whole (e.g., with friends, acquaintances, family, your partner) and the extent to which the following statements apply to you. In my face-to-face social interactions with others ….

Never	*Rarely*	*Occasionally*	*Sometimes*	*Frequently*	*Usually*	*Always*
1	*2*	*3*	*4*	*5*	*6*	*7*

1. Others seem to check their phones for messages and social media updates
2. Others seem to be using their phones to go online
3. Others place their phones where they can see them
4. Others seem worried that they will miss something important if they do not check their phones
5. Others seem like they lose awareness of their surroundings because of their phone use
6. Others seem like they have a difficult time putting their phones down
7. Others seem like they cannot stand leaving their phones alone
8. Others seem like they are "in their own worlds" using their phones
9. Others seem anxious if their phones are not nearby
10. Others pay attention to their phones rather than talking to me
11. Others would rather pay attention to their phones than talk to me
12. Others seem like they get rid of boredom by paying attention to their phones instead of me
13. Others seem like they feel content when they are paying attention to their phones instead of me

14. Others pay attention to their phones rather than focusing on me

15. Others seem like they get rid of stress by paying attention to their phones instead of me

16. Others seem like they feel good when they stop focusing on me and pay attention to their phones instead

17. Others shift their attention from me to their phones

18. I tell others that they interact with their phones too much

19. I have conflicts with others because they are using their phones

20. I find myself thinking “I’ve had enough” when others are using their phones

21. Others use their phones even though they know it irritates me

22. Others seem like they get irritated if I ask them to get off their phones and talk to me

Appendix O: Phubbing Scale (Study 6)

Using the scale provided please indicate how true each statement is of your general experiences. Please answer according to what really reflects your experiences rather than what you think your experiences should be. Please treat each item separately from every other item.

Never Sometimes *About half the time* *Most of the time* *Always*

1. My eyes start wandering on my phone when I'm together with others.
2. I am always busy with my mobile phone when I'm with my friends.
3. People complain about me dealing with my mobile phone.
4. I'm busy with my mobile phone when I'm with friends.
5. I don't think that I annoy my partner when I'm busy with my mobile phone.
6. My phone is always within my reach.
7. When I wake up in the morning, I first check the messages on my phone.
8. I feel incomplete without my mobile phone.
9. My mobile phone use increases day by day.
10. The time allocated to social, personal or professional activities decreases because of my mobile phone.

Appendix P: IPIP introversion scale (Study 7)

Using the scale provided please indicate how true each statement is of your general experiences. Please answer according to what really reflects your experiences rather than what you think your experiences should be. Please treat each item separately from every other item.

Very inaccurate	*Slightly inaccurate*	*Neither accurate nor inaccurate*	*Slightly accurate*	*Very accurate*

1. Want to be left alone
2. Prefer to do things by myself
3. Enjoy spending time by myself
4. Seek quiet
5. Don’t mind eating alone
6. Enjoy silence
7. Enjoy my privacy
8. Enjoy being part of a group
9. Enjoy teamwork
10. Can’t do without the company of others

Appendix Q: Social Desirability Scale (Study 7)

Below you will find a list of statements. Please read each statement carefully and decide if that statement describes you or not. If it describes you, check the word "true"; if not, check the word "false".

1. I sometimes litter
2. I always admit my mistakes openly and face the potential negative consequences
3. In traffic I am always polite and considerate of others
4. I have tried illegal drugs (for example, marijuana, cocaine, etc.)
5. I always accept others' opinions, even when they don't agree with my own
6. I take out my bad moods on others now and then
7. There has been an occasion when I took advantage of someone else
8. In conversations I always listen attentively and let others finish their sentences
9. I never hesitate to help someone in case of emergency
10. When I have made a promise, I keep it--no ifs, ands or buts
11. I occasionally speak badly of others behind their back
12. I would never live off other people
13. I always stay friendly and courteous with other people, even when I am stressed out
14. During arguments I always stay objective and matter-of-fact
15. There has been at least one occasion when I failed to return an item that I borrowed
16. I always eat a healthy diet
17. Sometimes I only help because I expect something in return

Appendix R: Schizotypal personality questionnaire—brief form (Study 7)

Below you will find a list of statements. Please read each statement carefully and decide if that statement describes you or not. If it describes you, check the word "true"; if not, check the word "false".

1. People sometimes find me aloof and distant

2. Have you ever had the sense that some person or force is around you, even though you cannot see anyone?

3. People sometimes comment on my unusual mannerisms and habits

4. Are you sometimes sure that other people can tell what you are thinking?

5. Have you ever noticed a common event or object that seemed to be a special sign for you?

6. Some people think that I am a very bizarre person

7. I feel I have to be on my guard even with friends

8. Some people find me a bit vague and elusive during a conversation

9. Do you often pick up hidden threats or put-downs from what people say or do?

10. When shopping, do you get the feeling that other people are taking notice of you?

11. I feel very uncomfortable in social situations involving unfamiliar people

12. Have you had experiences with astrology, seeing the future, UFOs, ESP, or a sixth sense?

13. I sometimes use words in unusual ways

14. Have you found that it is best not to let other people know too much about you?

15. I tend to keep in the background on social occasions

16. Do you ever suddenly feel distracted by distant sounds that you are not normally aware of?

17. Do you often have to keep an eye out to stop people from taking advantage of you?

18. Do you feel that you are unable to get “close” to people?

19. I am an odd, unusual person

20. I find it hard to communicate clearly what I want to say to people.

21. I feel very uneasy talking to people I do not know well

22. I tend to keep my feelings to myself

Appendix S: Partner Phubbing Scale (Study 9)

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

Low *Slightly low* *Moderate* *Slightly high* *High*

1. During a typical mealtime that my partner and I spend together, my partner pulls out and checks his/her cell phone
2. My partner places his or her cell phone where they can see it when we are together
3. My partner keeps his or her cell phone in their hand when he or she is with me
4. When my partner's cell phone rings or beeps, he/she pulls it out even if we are in the middle of a conversation
5. My partner glances at his/her cell phone when talking to me
6. During leisure time that my partner and I are able to spend together, my partner uses his/her cell phone
7. My partner does not use his or her phone when we are talking
8. My partner uses his or her cell phone when we are out together
9. If there is a lull in our conversation, my partner will check his or her cell phone

Appendix T: Social Connectedness Scale (Study 9)

Using the scale provided please indicate how much you agree or disagree with each of the following statements.

Strongly disagree	*Disagree*	*Somewhat disagree*	*Somewhat agree*	*Agree*	*Strongly agree*

1. I feel disconnected from the world around me
2. Even around people I know, I don't feel that I really belong
3. I feel so distant from people
4. I have no sense of togetherness with my peers
5. I don't feel related to anyone
6. I catch myself losing all sense of connectedness with society
7. Even among my friends, there is no sense of brother/sisterhood
8. I don't feel that I participate with anyone or any group

Appendix U: General Belongingness Scale (Study 9)

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

Strongly agree	*Agree*	*Somewhat agree*	*Neither agree nor disagree*	*Somewhat disagree*	*Disagree*	*Strongly disagree*

1. When I am with other people, I feel included
2. I have close bonds with family and friends
3. I feel like an outsider
4. I feel as if people do not care about me
5. I feel accepted by others
6. Because I do not belong, I feel distant during the holiday season
7. I feel isolated from the rest of the world
8. I have a sense of belonging
9. When I am with other people, I feel like a stranger
10. I have a place at the table with others
11. I feel connected with others
12. Friends and family do not involve me in their plans

Appendix V: Friendship Scale (Study 9)

Using the scale provided please indicate how true each statement is of your general experiences. Please answer according to what really reflects your experiences rather than what you think your experiences should be. Please treat each item separately from every other item.

During the past four weeks .....

Not at all	*Occasionally*	*About half the time*	*Most of the time*	*Almost always*

1. It has been easy to relate to others
2. I felt isolated from other people
3. I had someone to share my feelings with
4. I found it easy to get in touch with others when I needed to
5. When with other people, I felt separate from them
6. I felt alone and friendless

Appendix W: Multidimensional Scale of Perceived Social Support (Study 9)

We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement.

Very Strongly disagree	*Strongly disagree*	*Mildly disagree*	*Neutral*	*Mildly agree*	*Strongly agree*	*Very Strongly agree*

1. There is a special person who is around when I am in need
2. There is a special person with whom I can share joys and sorrows
3. My family really tries to help me
4. I get the emotional help and support I need from my family
5. I have a special person who is a real source of comfort to me
6. My friends really try to help me
7. I can count on my friends when things go wrong
8. I can talk about my problems with my family
9. I have friends with whom I can share my joys and sorrows
10. There is a special person in my life who cares about my feelings
11. My family is willing to help me make decisions
12. I can talk about my problems with my friends

Appendix X: Life Orientation Test-Revised (Study 10)

Please be as honest and accurate as you can throughout. Try not to let your response to one statement influence your responses to other statements. There are no "correct" or "incorrect" answers. Answer according to your own feelings, rather than how you think "most people" would answer.

Strongly disagree *Disagree* *Neutral* *Agree* *Strongly agree*

1. In uncertain times, I usually expect the best
2. It's easy for me to relax
3. If something can go wrong for me, it will
4. I'm always optimistic about my future
5. I enjoy my friends a lot
6. It's important for me to keep busy
7. I hardly ever expect things to go my way
8. I don't get upset too easily
9. I rarely count on good things happening to me
10. Overall, I expect more good things to happen to me than bad

Appendix Y: Paranoia scale (Study 10)

Please rate how applicable each belief is to you.

Not at all applicable to me	*Slightly applicable to me*	*Moderately applicable to me*	*Very applicable to me*	*Extremely applicable to me*

1. Someone has it in for me
2. I sometimes feel as if I'm being followed
3. I believe that I have often been punished without cause
4. Some people have tried to steal my ideas and take credit for them
5. My parents and family find more fault with me than they should
6. No one really cares much what happens to you
7. I am sure I get a raw deal from life
8. Most people will use somewhat unfair means to gain profit or an advantage, rather than lose it
9. I often wonder what hidden reason another person may have for doing something nice for you
10. It is safer to trust no one
11. I have often felt that strangers were looking at me critically
12. Most people make friends because friends are likely to be useful to them
13. Someone has been trying to influence my mind
14. I am sure I have been talked about behind my back
15. Most people inwardly dislike putting themselves out to help other people
16. I tend to be on my guard with people who are somewhat more friendly than I expected
17. People have said insulting and unkind things about me

18. People often disappoint me

19. I am bothered by people outside, in cars, in stores, etc., watching me

20. I have often found people jealous of my good ideas just because they had not thought of them first

Appendix Z: Patient Health Questionnaire (Study 10)

Over the last 2 weeks, how often have you been bothered by any of the following problems?

Not at all *Several days* *More than half the days* *Nearly every day*

1. Little interest or pleasure in doing things
2. Feeling down, depressed, or hopeless
3. Trouble falling or staying asleep, or sleeping too much
4. Feeling tired or having little energy
5. Poor appetite or overeating
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down
7. Trouble concentrating on things, such as reading the newspaper or watching television
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual
9. Thoughts that you would be better off dead or of hurting yourself in some way