UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

"I PHUB YOU BECAUSE…": TESTING A THEORY OF INTERPERSONAL BEHAVIOR FOR UNDERSTANDING AND PREDICTING PHUBBING

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

Degree of

DOCTOR OF PHILOSOPHY

BY

JUHYUNG SUN
Norman, Oklahoma
2024

“I PHUB YOU BECAUSE…”: TESTING A THEORY OF INTERPERSONAL BEHAVIOR FOR UNDERSTANDING AND PREDICTING PHUBBING

A DISSERTATION APPROVED FOR THE
DEPARTMENT OF COMMUNICATION

BY THE COMMITTEE CONSISTING OF

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Acknowledgments

Throughout my years at the University of Oklahoma, I have been fortunate to receive support and encouragement from numerous individuals. First and foremost, I would like to express my deepest appreciation to my advisor, Dr. Norman Wong, for his unwavering support, invaluable guidance, and warm encouragement. Your leadership, mentorship and dedication have truly been a cornerstone throughout my doctoral journey.

Second, I would like to thank my committee members, Dr. Ioana Cionea, Dr. Claude Miller, and Dr. Doyle Yoon. Their direction, expertise, and feedback have enriched the depth and quality of my work. Thank you each for your time and kind enough to help me complete this journey.

Lastly, I could not have completed this academic journey without my family – my parents (Gyusoo Sun and Sunghee Park), my older brother (Jihoon Sun), and my grandmother (Geumnam Lee) – as well as my friends back in South Korea. To my parents – I am so blessed that you are my parents. Your unconditional love, encouragement, and unwavering support have sustained me in completing this journey successfully. I love you and deeply admire you both.

This work would not have been possible without all those mentioned above and many more. I am deeply thankful for each and every one of you.

Table of Contents

List of Tables

List of Figures

Abstract

Phubbing (i.e., *phone* and *snubbing*) is toxic to most individuals. Unlike their perceptions that it is rude, they still phub others. With the prevalence of such behavior in the current age of high technology, it is necessary to understand what motivates people to phub others and examine whether people phub others consciously or unconsciously. The current study examined these questions based on Triandis's theory of interpersonal behavior (TIB). First, this study developed and validated a self-report measure of phubbing and its predictors based on TIB. 102 items in total across the ten scales – phubbing, outcome beliefs, outcome evaluations, norms, social roles, self-concepts, affect, habits, facilitating conditions, and intentions – were initially developed in Study 1 (n = 349) through extensive literature reviews and screenings by four subject-matter experts. The results of exploratory factor analysis (EFA) reduced items to 72, showing low loadings and cross-loaded items. With newly collected data (n = 811), Study 2a evaluated and confirmed the retained items and dimensions from Study 1 through confirmatory factor analysis (CFA). The CFA results, which led to 55 items being retained, suggested that the developed scales were valid and reliable. Structural equation modeling (SEM) was conducted using those scales to test proposed hypotheses suggested by TIB in Study 2b. The results revealed that TIB was an effective framework for explaining why people phub others. Also, results indicated that attitudinal, social, and emotional factors were significantly associated with phubbing intentions. These phubbing intentions, habits, and facilitating conditions were significantly related to phubbing behavior. In all, the findings of this dissertation contribute to the understanding of phubbing behavior. This study also advances theoretical, methodological, and practical knowledge about phubbing.

Keywords: phubbing behavior, theory of interpersonal behavior, predictors of phubbing, confirmatory factor analysis, structural equation modeling

Chapter 1. Introduction

Over the past decades, various information and communication devices have been introduced and have changed our lives. Chief of all, a small handy device –the *smartphone* (i.e., a mobile device that combines the functionality of the web and phone) – has been leading changes in human life beyond merely providing information and communication services. With this little tool, an individual can accomplish anything regardless of time or distance. For example, people can communicate with others (via calls, text messages, emails, and social media) and have access to unlimited information and knowledge, manage financial services, read books/magazines, listen to music, take pictures/videos, and play games.

Many individuals have started to use these devices more frequently and have grown dependent on them since they have made their lives easier and simpler. Indeed, a recent report (Statista, 2022) revealed that while just 5% of American adults use their phones for less than an hour, 70% of Americans use them for over 5 hours each day for personal needs (excluding work-related use). As such, smartphones are always with us, and it is almost impossible to imagine daily lives without them.

There may be questions as to why so many people use their smartphones so much and what makes them obsessed with their devices. One possible explanation is that smartphones satisfy our fundamental needs. People use smartphones for *extrinsic* and *intrinsic* reasons (Fischer, 1992; Keller, 1977; Noble, 1987). According to research studies, extrinsic or instrumental motivations are related to the utility of a phone. Using a smartphone for tasks and activities that make our lives easier and more convenient, such as searching for information, scheduling meetings via phone or text, capturing special events with photos and videos, and enjoying entertainment content through music, movies, and games, is extrinsic motivation. On the contrary, intrinsic, also known as social motives, indicate using phones for social needs, such as communicating and interacting with others to feel a sense of

belongingness, inclusion, and security. In particular, people are more likely to use their phones for social than instrumental needs (Fischer, 1992; Keller, 1977; Noble, 1987).

Paradoxically, however, smartphones, primarily used to satisfy people's social and communication needs, can damage our interactions and relationships. In other words, smartphones allow us to maintain and strengthen our current interpersonal relationships (e.g., romantic relationships, friendships, and family relationships) and establish new ones (Jin & Pena, 2010; Wei & Lo, 2006). However, they can severely disturb current moments with valuable others. Even worse, someone may focus more on their devices than their conversation partners. This phenomenon is called *phubbing* (Miller-Ott & Kelly, 2015; Przybylski & Weinstein, 2013). As a neologism combining two words (i.e., phone and snubbing), the term initially emerged as part of the "Stop Phubbing" campaign by an Australian English dictionary – Macquarie Dictionary – to raise awareness about problematic phone use. Phubbing indicates snubbing someone in favor of one's phone while interacting with others (Karadağ et al., 2015).

Someone may point out that phubbing is just a simple use of one's smartphone. The problem is using a smartphone in interpersonal situations (e.g., in a meeting, while working on a project, or while having a meal together). Indeed, according to the Pew Research Center (2015), a majority of American adults believe that using their phones in public situations – while walking down the street (77%) and waiting in line (74%), on public transit (75%) – is admissible. However, nearly every respondent perceives such behavior as unacceptable in social situations, such as during a family dinner (88%) or a meeting (94%). This perception may be because, in interpersonal interactions, people generally expect interactive engagement by exchanging verbal and nonverbal messages, such as gazing at each other and vocalizing. However, glancing at and using their phone during the conversation hampers active communication and hurts the partner's feelings. Indeed, while people are distracted by their

phones, their partners feel disconnected from them and excluded from the interactions (Beukeboom & Pollmann, 2021; Chotpitayasunondh & Douglas, 2018). The reason is that phubbing behavior implies disinterest in and disengagement from conversation partners and relationships (Vanden Abeele, 2020).

Many people continue to phub others, even though they view phubbing as disrespectful, impolite, and inconsiderate behavior. In fact, even as of nine years ago, nine out of ten American adults admitted to using their phones during their most recent social interactions (Pew Research Center, 2015). This report also revealed that people use their phones during their social gatherings to read a message (e.g., text messages and emails), followed by taking a photo/video, sending a message, receiving an incoming call, checking whether they have received any notifications, and placing a call.

It is possible for some individuals to purposefully phub others. For instance, people may use their phones to quietly express to others that they are uninterested or uncomfortable in a conversation topic. As a coping strategy, this deliberate phubbing enables people to protect themselves from unwanted negative feelings. However, despite conscious recognition that phubbing is commonly considered unacceptable social behavior, the statistics above suggest that phubbing can be a form of mindless behavior. The role of cognitive dissonance can explain this paradox. The inconsistency between beliefs and behavior toward phubbing indicates the possibility of unconscious processes. People may be unaware of how much they may engage in phubbing. Therefore, without consciousness, someone may phub others unconsciously or habitually. Also, phubbing behavior can be either facilitated or impeded by particular contextual cues. For instance, notifications and alerts from emails, text messages, and social media can induce a sense of urgency in people, making them check their phones immediately whether or not their conversation partner is there. In addition, when their conversation partner engages in phubbing behavior, people may feel pressured to begin

mirroring with their phones. Thus, various factors can trigger phubbing, and people might engage in phubbing behavior intentionally (with awareness) or unconsciously (without awareness).

Examining the question of whether phubbing is a conscious or unconscious behavior is important for several reasons. Knowing whether phubbing is a conscious or unconscious behavior helps us fully comprehend such behavior. Most human actions result from a blend of conscious and unconscious functions working together (Baumeister & Bargh, 2014). Individuals can better understand why they phub others by learning how their conscious decision-making processes work when they are aware of their phubbing behavior. Then, unconsciousness supplements the aspects of phubbing behavior that are not explained by the conscious process alone. Second, examining phubbing through conscious and unconscious perspectives is important because the study's results will diagnose and verify the current social atmosphere toward technology use. If people knowingly engage in phubbing behavior despite being aware of its negative consequences, it implies that contemporary society now faces a pitfall in that people value their phones and online interactions more than real human interactions. Furthermore, it is possible to infer that technology will soon replace human interactions. However, if people phub others unconsciously, it suggests that technology has ingrained more deeply than expected.

Despite the topic's significance, there is a notable absence of specific studies elucidating these fundamental aspects of phubbing. Very few studies have explicitly employed theoretical frameworks initially developed to understand complex human behavior in the context of phubbing. Only one study has applied one of the most often-used human behavior theories to predict phubbing behavior. Büttner and colleagues (2022) employed the theory of planned behavior (TPB; Ajzen, 1985) to examine why individuals phubbed others based on the three components of the theory – attitude toward the behavior, subjective norms,

and perceived behavioral control. Even though their study was the first to apply the well-developed theory to investigate phubbing behavior, the question of whether phubbing is conscious or unconscious behavior has yet to be explored. This exclusion can be associated with the fundamental assumption of TPB, which points out conscious and rational aspects of human behaviors driven by attitudes, subjective norms, and behavioral control (Ajzen, 1985).

In seeking to offer a novel approach by answering the two research questions simultaneously (i.e., whether phubbing is a conscious or unconscious behavior and what factors specifically lead people to engage in phubbing behavior), this study has selected the theory of interpersonal behavior (TIB; Triandis, 1977). This specific theory has been applied in this study over other theories, such as the theory of reasoned action (TRA; Ajzen & Fishbein, 1980) and the theory of planned behavior (TIB; Ajzen, 1985), to comprehend phubbing behavior based on the following three reasons.

First, compared to other theories, TIB aims to explain interpersonal behaviors, emphasizing the understanding of human behaviors in interpersonal interactions and relationships (Triandis, 1977). As phubbing happens in interpersonal dynamics and relationships, TIB is well-suited for understanding phubbing. Second, TIB has more explanatory powers in predicting human behavior than TRA and TPB (Egmond & Bruel, 2007; Gagnon et al., 2003; Pee et al., 2008). The reason is that TIB encompasses all components of TRA and TPB while further integrating additional factors such as habits, emotions, and facilitating conditions (Limayem et al., 2004). Lastly, there are limitations to comprehending the entire nature of human behaviors using TRA and TPB, as these theories mainly focus on consciousness and rationality as processes for explaining behavior. In this sense, both TRA and TPB are insufficient to explain phubbing behavior, especially when describing unconscious perspectives of it. For instance, someone may automatically check or use their phone in the presence of others without thinking. There may be no specific reasons

to engage in phubbing behavior. Their routine/habit or some external cues can facilitate the behavior (e.g., receiving message notifications). As such, conscious, unconscious, and external factors may simultaneously influence individuals' phubbing behavior. Given that TIB highlights intuitive and unconscious aspects of human behavior in addition to rational functions, TIB is effective in analyzing and describing the nature of phubbing behavior.

Taken together, this study applies TIB in the context of phubbing, aiming to test its constructs – (a) behavioral intentions driven by attitudes, social factors, and affect, (b) habits, and (c) facilitating conditions –, thereby demonstrating what factors significantly predict phubbing behavior. This study also seeks to identify which factors strongly affect phubbing behavior. Consequently, this study offers fresh approaches to conceptualizing, operationalizing, and comprehending phubbing behavior by identifying why individuals phub others and whether it happens consciously or unconsciously.

Importance and Significance of this Study

The study of phubbing is vital, especially in today's smartphone-essential society, where smartphones have become indispensable. Whether or not deliberate, phubbing behavior is detrimental per se by hurting partners' feelings and damaging interpersonal interactions. The most noticeable point is that people know how bad such behavior is, but they still snub partners in favor of their phones while spending time together. By identifying the underlying motivations and examining whether phubbing occurs consciously or unconsciously, this study will help develop targeted approaches to address this pervasive issue as follows.

Theoretical Significance

This dissertation will have several theoretical implications. By examining possible predictors of phubbing behavior, researchers will comprehend better what motivates people to engage in phubbing behavior. Such work will extend interpersonal communication theories

(e.g., TIB; Triandis, 1977) into the field of phubbing, enhancing their utility and heuristic values. It is particularly noteworthy, as very few studies in the field of phubbing have applied and tested well-grounded theories entirely. Therefore, this dissertation will demonstrate the values and applicability of TIB in technology-mediated interpersonal communication research and, in turn, assist researchers in developing theoretical lenses for their future studies.

Methodological Significance

This dissertation also will have methodological significance. Some scholars have developed scales measuring phubbing behavior. However, there are several concerns to be addressed. For example, Karadağ et al. (2015) developed a 10-item phubbing scale based on many virtual addictions (e.g., showing addictive symptoms in using a mobile phone, SMS, social media, game, etc.), and it appeared to have two factors: *communication disturbances* (i.e., interruptions during face-to-face interactions due to one's phone) and *phone obsession* (i.e., one's constant needs to use their phones during face-to-face interactions). In the development process, their scale's face and content validity were not examined. Also, several items of their scale (i.e., especially the items of phone obsession factor such as "I feel incomplete without my mobile phone" and "my mobile phone use increases day by day") do not capture phubbing behavior itself well. Instead, they are more relevant to one's addictive/problematic behavior in using them, regardless of the presence of others. Addictive or problematic smartphone use is not necessarily related to phubbing. Therefore, in this study, a new phubbing behavior scale will be developed and tested by emphasizing phone use in interpersonal settings (e.g., while spending time together) to overcome those limitations from previous studies, and thus, assess individuals' phubbing experience more accurately.

Along with developing a new phubbing scale, this dissertation will create and test other scales to guide operational definitions of Triandis's (1977) variables, especially in the

context of phubbing behavior. As scholars have not given this framework much attention, there are no existing scales measuring TIB predictors (e.g., outcome beliefs, outcome evaluations, self-concept, social norms, affect, and facilitating conditions), especially in the context of phubbing behavior. Therefore, as an initial step, this study will focus on operational concepts of phubbing and TIB variables. Scales to measure these concepts will then be created and validated through EFA and CFA, before examining the influences of components from TIB on phubbing behavior. As a result, this study will offer researchers new measurement scales that can be used to examine various aspects of phubbing within the TIB framework.

Practical Significance

The findings presented herein will have practical implications regarding phone use, designing campaigns, and educating phone users. Understanding why individuals engage in phubbing should be the first step for interventions to foster healthier smartphone usage behavior. The findings of this study will be beneficial if they target the audience's intentional (attitude and social factors), unintentional (habits), and contextual factors when tailoring their messages. At the same time, by identifying the possible motivations behind phubbing behavior, smartphone users, especially those who frequently use their phones during interpersonal settings, will be aware of their smartphone usage behaviors and seek to reduce the amount of inappropriate phubbing behavior in their daily lives. Consequently, this research will help reduce the risks of damaging their interlocutors' feelings, interactions, and relationships.

In sum, this research aims to advance knowledge on phubbing behavior by applying a multidimensional theoretical framework (i.e., TIB) and identifying what factors motivate people to phub others. In addition, this study will define phubbing behavior and its relevant predictors from TIB conceptually and operationally. Based on these conceptual and

operational definitions, this study will clarify how each concept will be measured by developing measurements of constructs from TIB. Developed scales will be tested and validated through advanced-level statistical techniques (e.g., exploratory factor analysis and confirmatory factor analysis). Through this study, the ultimate goal is to inform underlying factors and motivations driving phubbing. As a result, many people will recognize their smartphone usage patterns in the presence of others, and thus, healthier technology-related behaviors in their interpersonal settings will be promoted.

Remaining Chapters

Chapter 1 introduced the phubbing phenomenon. This chapter briefly introduced the concept of phubbing and overviewed a theoretical framework –TIB by Triandis (1977). This section specified the purpose of this dissertation and established the importance of studying phubbing behavior and its significance from theoretical, methodological, and practical standpoints. In addition to Chapter 1: Introduction, there are five more chapters in this dissertation: Chapter 2: Literature Review; Chapter 3: Study 1 – Methods and Results; Chapter 4: Study 2a – Methods and Results; Chapter 5: Study 2b – Results; and Chapter 6 – Discussion and Conclusion.

Chapter 2 is dedicated to an extensive and in-depth review of the literature on phubbing behavior and TIB, encompassing six areas. The first stream defines and conceptualizes phubbing behavior. The second stream examines prior research on the variables that influence phubbing behavior. A new approach to comprehending why and how individuals phub others is introduced in the third stream. The fourth stream explores different predictors of human behavior while employing the theoretical underpinnings of TIB. In the fifth stream, TIB constructs are conceptualized in the context of phubbing. As a last stream, this chapter indicates the hypothesized conceptual framework in the context of phubbing and proposed hypotheses.

Chapter 3 describes how Study 1 is conducted. This section covers the first two phases of scale development by Boateng et al. (2018). As the first phase, this chapter identifies what is being measured, generates the pool of items, and determines the scales for measuring the concept of phubbing and its relevant predictors. It also presents a detailed procedure for creating the scales, discussing stages from item generation to scale development. In addition, this chapter describes the research method, sample, and procedure for exploratory factor analysis (EFA) in Study 1, which will be a critical foundation for Study 2a.

Chapter 4 provides the results of Study 2a by illustrating the remaining scale development procedures, primarily on scale assessment. This chapter presents the criteria used to evaluate and validate the developed scales, involving outlines of the research design, data collection procedures, and statistical analyses. Additionally, it provides the results of each scale's CFA, reliability, and validity.

Chapter 5 presents the results of Study 2b. It specifically provides information about covariates and shows preliminary results of correlations between the study variables developed and validated through Study 1 and Study 2a. This chapter also provides the results of the hypotheses proposed in this study.

Chapter 6 wraps up this dissertation by summarizing the major findings of Studies 1, 2a, and 2b and interpreting them in the context of the existing literature. Based on the results of this dissertation, theoretical, methodological, and practical implications are also discussed. Finally, study limitations and recommendations for future research are presented.

Chapter 2. Literature Review

Conceptualization of Phubbing

The term phubbing was first introduced as a part of the "Stop Phubbing" campaign by the Macquarie Dictionary. It was launched to combat and stamp out emerging problems related to phone use in interpersonal dynamics, such as neglect by phone. Derived from two words – *phone* and *snubbing*, the concept of phubbing has been defined in various ways. Phubbing indicates the act of "…looking at his or her mobile phone during a conversation with other individuals, dealing with the mobile phone, and escaping from interpersonal communication" (Karadağ et al., 2015, p. 60). Phubbing is also described as "…using a smartphone in a social setting of two or more people and interacting with the smartphone rather than the person or people present" (Chotpitayasunondh & Douglas, 2016, p. 10).

Additionally, phubbing is characterized as "…snubbing someone in a social setting by looking at your smartphone instead of paying attention" (Chotpitayasunondh & Douglas, 2018, p. 304). Moreover, phubbing is defined as "…halting face-to-face communication with another person to interact with their telephone" (Erzen et al., 2021, p. 57). Phubbing, although defined differently by different researchers, generally indicates using a phone in social and interpersonal situations, making others feel unimportant.

Based on the given definitions, this research similarly conceptualizes phubbing as the act of disregarding or treating interlocutor(s) during face-to-face interactions inattentively in favor of checking and using one's phone. Phubbing encompasses any phone-related distractions that are against the conversational manner. For example, when people look at their phone screen (e.g., to check notifications and time), send messages to those who are not present, check social media posts, or take phone calls, all these examples can be considered phubbing. When individuals fail to maintain eye contact and pay full attention to their conversation partners due to their phones, they show phubbing behavior.

In phubbing, there are two different roles: *phubber* and *phubbee.* Individuals who exhibit phubbing behavior are called phubbers, while those who are phubbed are phubbees. Someone becomes the phubber, for instance, when they mindlessly reply to text messages while going out to dinner with their romantic partner. However, their partner turns into the phubbee, who cannot get the phubber's full attention. As this study aims to examine what factors lead to phubbing behavior, phubbers' perspectives are primarily investigated.

Predictors of Phubbing

The antecedent-behavior-consequence (ABC) model, as known as functional behavior analysis, points out that human behavior can be explained by a framework consisting of three main components: antecedent, behavior, and consequence (Bijou et al., 1968; Iwata et al., 1994). In the model, internal and external factors function as stimuli and triggers for actions, particularly as antecedents. Attribution theory by Heider (1958) clarified these dispositional (internal) and situational (external) elements in determining a particular behavior. Dispositional or internal elements are more broadly defined as individual characteristics, such as personality traits, psychological/mental features, and emotions, while situational or external factors include social norms, peer pressure, and cultural traditions.

The ABC model and attribution theory provide a comprehensive approach to understanding how a particular behavior is determined. Both frameworks emphasize the importance of considering internal and external influences on a particular behavior. In this regard, this dissertation employs their holistic approach to understanding phubbing behavior because it is also one of the behaviors people specifically show in interpersonal settings. Specifically, this dissertation classifies predictors of phubbing behavior into two categories based on previous studies: (a) *internal* and (b) *external* factors, assuming that these factors interact in determining phubbing behavior.

Internal Factors of Phubbing

Personality Traits. First, as a core feature of the self, personality is a stable and internal factor that affect our behaviors in almost every context of our daily lives, including workplaces, online interactions, and interpersonal relationships (Barrick & Mount, 1993; Snyder & Cantor, 1998). People with different personality traits behave and react to the same situations differently. In this regard, personality traits are significant factors that shape an individual's behavior (Lee & Ashton, 2005).

The Big Five Personality Model (i.e., extraversion, openness to experience, conscientiousness, neuroticism, and agreeableness), developed by Costa and McCrae (1987), has been widely used to investigate the relationships between personality traits and phubbing behavior. For instance, Erzen and colleagues (2021) examined all the Big Five Personality traits to explore the role of personality traits by conducting correlation and hierarchical regression analyses with Turkish college students. Their results showed that phubbing was negatively correlated to conscientiousness and positively related to neuroticism. Concerning the hierarchical regression results, similar to the findings of the correlations, neuroticism, and conscientiousness had significant predictive power for individuals' phubbing behavior. According to their results, people with high levels of neuroticism and those with low conscientiousness tend to phub others more frequently.

Sun and Samp (2022) also aimed to examine how dispositional factors – personality traits – influenced phubbing behavior. Of the five characteristics, neuroticism and agreeableness were studied in their research. Their study studied phubbing behavior, especially with a focus on friendships. College students between the ages of 18 and 29 participated in their study. Their results showed that neurotic and disagreeable individuals were more likely to show phubbing behavior with friends.

Taken together, the literature on phubbing has investigated how individual differences – particularly those related to one's personality – influence phubbing behavior by adopting

the Big Five Personality Model. These studies highlight the importance of exploring personality features as the fundamental dispositional components of the self to understand why people engage in phubbing behavior.

Psychological or Risk Factors. In addition to the personality dimensions, our behaviors can be explained by psychological factors or mental health (Miller & Aloise, 1989). These factors are closely associated with problematic behaviors in using information and communication technologies (Billieux et al., 2015). In the context of phubbing, some studies have suggested the importance of psychological factors and demonstrated their roles in predicting phubbing behavior. For instance, Guazzini and colleagues (2019) formulated a multidimensional model associated with phubbing behavior by focusing on *anxiety*. In terms of anxiety, the authors classified anxiety into two dimensions: *trait anxiety* (i.e., feelings of anxiety over every moment, event, or future) and *social anxiety* (i.e., feelings of anxiety, especially in their social situations). In their study, these two anxiety dimensions were examined to predict phubbing behavior. Their findings demonstrated that both trait and social anxiety were positively correlated to phubbing. In other words, anxious individuals tend to phub others more.

As other psychological or risk factors, Chi et al. (2022) examined the role of *fear of missing out* (FoMO; i.e., the desire to stay constantly connected with others so that a person does not miss what others are doing; Przybylski & Weinstein, 2013) to predict phubbing behavior. By collecting the data through surveys, they discovered a positive correlation between FoMO and phubbing among undergraduate students, indicating that the likelihood of engaging in phubbing increased with FoMO levels. In addition, phubbing is significantly predicted by *depression*, which refers to feelings of sadness, poor mood, and loss of interest in daily life (Rottenberg, 2005). For instance, Sun and Samp (2022) examined depression in explaining what motivates people to phub others in friendships, in addition to personality

elements. The researchers postulated that psychopathological elements, such as depression symptoms, can lead to improper smartphone use. According to their results, depression was positively associated with phubbing, indicating that individuals with high levels of depression were likely to engage in phubbing behavior when they were with their friends. *Loneliness* also causes phubbing behavior. Indeed, Zhan and colleagues (2022) suggested loneliness could be linked to phubbing behavior. In order to support their ideas, they adopted the media dependency theory introduced by Ball-Rokeach and DeFleur (1976), assuming that lonely individuals would depend heavily on their phones to satisfy social and information needs. Their results showed a positive direct association between loneliness and phubbing. Specifically, individuals with intense feelings of loneliness were likely to exhibit phubbing more than those with lower levels of loneliness.

Taking together, it is clear that psychological elements have significant impacts on phubbing behavior. Specifically, psychologically unhealthy people, especially those who have high levels of anxiety, depression, loneliness, and FoMO, show strong tendencies to engage in phubbing behavior more than those who are psychologically healthy.

Ability. When there are impulsive temptations to act in a risky manner, one's ability to manage and control their behavior serves an important role. In fact, as an underpinning internal state, self-control or self-regulation has been identified as a crucial predictor of problematic behaviors (Protogerou et al., 2020). Closely related to healthy behaviors, *self-control* indicates the ability to inhibit or control one's emotions, reactions, and behaviors to avoid impulsive behavior. (Tangney et al., 2004). *Self-regulation* is the ability to identify, manage, and control one's thoughts, feelings, and behaviors to achieve specific goals or meet certain standards (Zimmerman, 2000).

Although these two terms have been used interchangeably in previous studies (Baumeister et al., 2007), they have slightly different nuances in their meanings. While self-

control is about managing and restraining immediate and intense desires and impulses, self-regulation is a broader and deliberate concept encompassing self-control through a monitoring process (Gillebaart, 2018). That is, self-regulation specifies that individuals should monitor and understand any discrepancies between their specific goals (i.e., meet certain standards) and impulses and then control their emotions, thoughts, and behaviors in the desired way (Gillebaart, 2018).

In the context of phubbing, several studies have investigated how self-control or self-regulation plays a role in predicting phubbing behavior. For example, Benvenuti et al. (2020) proposed a theoretical model of phubbing. As a part of their model examining which factors led to phubbing behavior, they tested the relationships among self-control, self-esteem, well-being, Internet addiction, and phubbing in emerging Italian adults. For their study, they collected the data through an online survey. Then, they analyzed the data through correlation. It was found that self-control was negatively correlated to phubbing. Next, structural equation modeling was conducted to test the theoretical model. The results of the authors' study demonstrated that self-control was the only significant predictor of Internet addiction. That is, in their research, as a significant indirect association, self-control was only related to Internet addiction, which, in turn, led to phubbing, whereas self-esteem and well-being were not.

Self-regulation, which is similar to the concept of self-control, also has been studied to understand phubbing behavior. For instance, Sun and Miller (2023) proposed a model that examined the associations among attachment patterns, smartphone attachment, and self-regulation. With a quantitative approach, they collected the data via an online survey and conducted structural equation modeling analysis to investigate those relationships. When demographic characteristics (i.e., age and gender) and smartphone usage patterns (i.e., durations of smartphone use) were controlled in their model, self-regulation was negatively

associated with phubbing behavior. It was also shown that self-regulation mediated the relationship between phubbing and avoidant attachment style.

Taken together, these earlier studies indicate that various internal factors, such as personality characteristics, psychological well-being, and self-regulatory, determine phubbing behavior. This comprehensive understanding highlights the significance of considering internal elements to explain what factors lead to phubbing behavior.

External Factors of Phubbing

Along with internal factors, external factors significantly affect behavior (Ross & Nisbett, 1991). More specifically, human behaviors are susceptible to the influences of social and situational contexts. According to the theory of informational and normative influence, behaviors are determined by these extrinsic influences, especially when individuals need more certainty and belongingness (Deutsch & Gerard, 1955). In other words, when people are in ambiguous situations with high levels of uncertainty, they tend to look at how most others around them behave and adopt the opinions of others in their groups (Sherif, 1936). Individuals also have a tendency to rely on external factors (e.g., social norms) because they fear rejection and exclusion from their group and society (Deutsch & Gerard, 1955). Therefore, as social creatures, humans behave based on their surrounding social factors.

Social Factors. Of many external factors that influence a certain human behavior, the society to which individuals are raised and belong and the members with whom they interact determine how to respond to different social settings. In fact, social norms, as one of the solid external stimuli, directly shape human behaviors (Mollen et al., 2010). *Social norms* are, as conformity, unwritten rules that govern behaviors by members of a given group or society (Bicchieri & Mercier, 2014).

Regarding human behaviors, the literature on social norms has classified them into two broad categories: descriptive and injunctive. *Descriptive norms* refer to perceptions of

whether a behavior is commonly exhibited by society members (i.e., the prevalence of behaviors in a group or society; Chung & Rimal, 2016). On the one hand, *injunctive norms* indicate beliefs of what behaviors are approved or disapproved in a social context by others (i.e., expected behaviors by others in a group or society; Chung & Rimal, 2016). In other words, descriptive norms are whether behaviors are easily observed in society by other society members, whereas injunctive norms represent whether other people also believe such behaviors are acceptable and moral in a group or society.

The role of social factors in phubbing has been studied in previous research. For instance, Li and colleagues (2021) examined how social norms were relevant to phubbing behavior. The researchers gathered data from Chinese college students to find the relationship between social norms and phubbing. According to their results, a positive relationship was found between perceived social norms and phubbing; those with higher levels of perceived social norms were more likely to exhibit phubbing behavior than those with lower levels.

Similarly, Leuppert and Geber (2020) explored descriptive and injunctive social norms to predict phubbing behavior. In the context of phubbing, they defined descriptive norms as the perception of how prevalent phubbing is among people around them. In contrast, injunctive norms pertain to the perception of whether such behavior is socially acceptable. Their findings from an online survey revealed that phubbing was more closely associated with descriptive than injunctive phubbing norms. It indicates that individuals tend to phub others more frequently when they perceive that such behavior is prevalent among most people.

Schneider and Hitzfeld (2021) focused on normative aspects of phone use, namely mobile phone norms (MPN) – that is, the perception of whether mobile phone use in various settings is acceptable or unacceptable – based on injunctive norms to investigate the relationships between social norms and phubbing behavior. The findings of their online

survey supported their expectations that one's MPN would constrain their phubbing behavior. In other words, the stronger people adhere to mobile phone norms that using phones in social settings is against etiquette, the less they engage in phubbing behavior.

Taken together, as these empirical previous studies have demonstrated, social factors, particularly social norms, including descriptive and injunctive norms, serve as significant predictors of phubbing behavior. Therefore, this dissertation acknowledges the social-oriented nature and aims to enrich the understanding of its social influences on phubbing behavior.

Situational Factors. *Situational factors* are contextual and environmental conditions that influence one's behavior (Heider, 1958). They are essential to predict human behaviors (Endler & Magnusson, 1976). These factors can be applied to the context of phubbing behavior. Indeed, although it occurs in almost any situation (Ugur & Koc, 2015), some studies have pointed out the importance of situational factors by identifying specific situations that facilitate phubbing behavior. For instance, Al-Saggaf and MacCulloch (2018, 2019) examined frequency, contexts, and types of relationships in phubbing. It was shown that people were more likely to engage in phubbing, especially with close others (e.g., friends and family members) than strangers. Also, their findings revealed that people were more likely to look at or use their phone during face-to-face interactions with others(s), especially when commuting on public transport, during work, coffee/ lunch breaks, and when socializing with friends than during work-related meetings. As such, several contextual factors significantly contribute to facilitating phubbing behavior.

To summarize previous studies of the phubbing-related literature discussed above, it implies the complexity of phubbing behavior, characterized by a variety of internal and external influences. In other words, phubbing behavior is influenced by multiple-level factors, from individual and social to situational influences. However, the most significant

limitation of the existing phubbing literature is that they separately examine the specific roles of personal traits, social norms, or situational context. Very few studies have attempted to create a comprehensive phubbing framework by integrating all the possible predictors and examining them fully. Due to these isolated examinations, only unidimensional aspects of phubbing have been addressed so far, rather than a multidimensional view. Therefore, this dissertation offers a novel approach by exploring a variety of influences on phubbing across multiple levels simultaneously, which will be detailed next.

Breaking Mold: A Novel Approach for Advancing Phubbing Research

In addition to not integrating multi-level components at once, prior studies have not examined unconscious dimensions. Specifically, automatic and habitual tendencies have not been studied yet to predict individuals' phubbing behavior in previous studies. As emphasized in Chapter 1 briefly, understanding unconscious levels is essential in that human behaviors are the product of both conscious and unconscious processes.

While existing studies have contributed to the literature on phubbing by identifying various predictors, they also have not applied a well-grounded theoretical framework to understand phubbing behavior. According to Babbie (2016), a robust theoretical framework is important to include in a study, as it enables researchers to organize and integrate existing knowledge, guide research, and provide a systematic approach to studying a research topic. Also, the author emphasizes the importance of applying the theory to the study in that it helps researchers make sense of their findings by explaining the complex interplay of factors and identifying relationships between variables of the theory.

Therefore, this dissertation presents innovative approaches beyond merely filling a gap in the phubbing literature. One of the well-established theoretical frameworks is employed to account for multidimensional phubbing behavior. More specifically, TIB is used in the context of phubbing behavior due to many strengths, as indicated in Chapter 1 in detail.

Briefly, TIB is compressive in integrating individual, social, and situational factors to predict a particular human behavior. Second, TIB enables this study to address whether phubbing is conscious or unconscious because TIB provides both conscious and unconscious dimensions of human behavior by including decision-making and habitual processes.

In summary, this dissertation introduces new approaches by examining undiscovered areas that have never been studied in previous studies. Using the entire TIB framework to predict phubbing behavior, this study identifies what factors significantly lead to phubbing behavior and whether phubbing is conscious or unconscious. Consequently, the multifaceted nature of phubbing behavior is demonstrated.

Theoretical Framework: Theory of Interpersonal Behavior (TIB)

Human actions are inherently complex. It is challenging to understand the reasons behind an individual's actions. The reason is due to the simultaneous influences of multiple factors in determining a given behavior, from internal (e.g., personality traits, psychological status) to external stimuli (e.g., environmental factors) (Staats & Staats, 1963). Several well-developed theories have been introduced to predict such complicated human behaviors. As mentioned earlier, this study explicitly applies TIB by Triandis (1977) to examine the possible reasons behind individual phubbing behavior. In the following sections, this study provides an in-depth review of the theory, explaining its components and their relevance to interpersonal interactions.

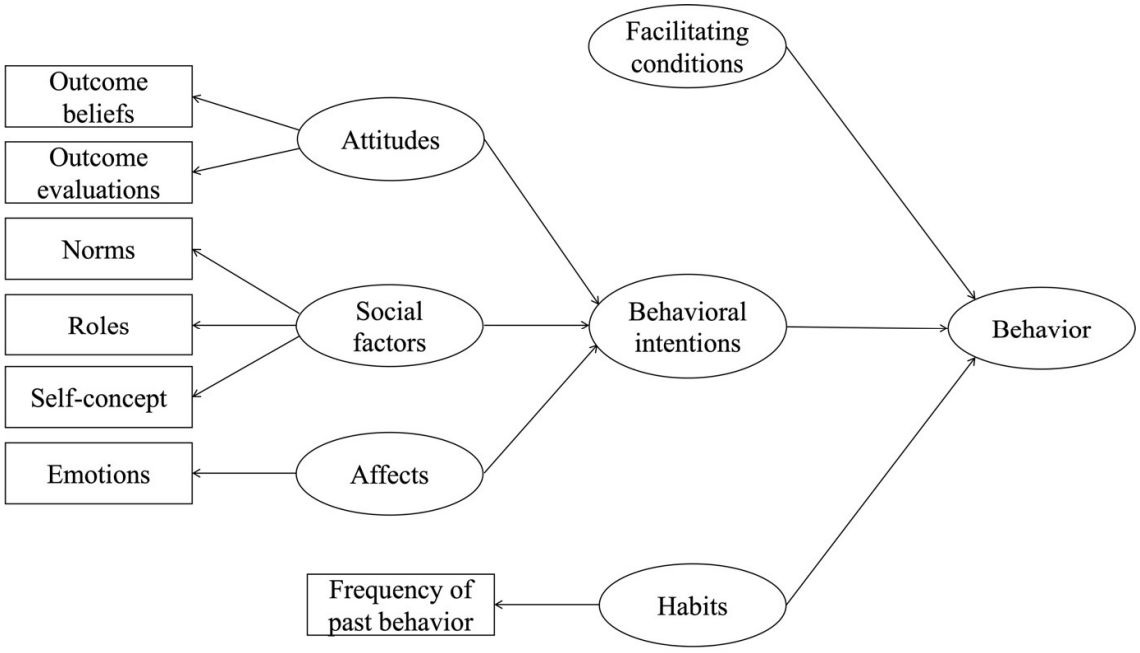
In the late 1970s, social psychologist Harry Triandis introduced the interpersonal behavior theory (TIB). His purpose in developing TIB was to understand human behaviors, especially in interpersonal settings. He assumed that human behaviors are not fully deliberative or autonomous. Instead, various individual, social, habitual, and situational factors shape them simultaneously. Based on his fundamental assumption, he brought forth and included different constructs to create a comprehensive theory, thereby explaining how

people interact across various interpersonal settings and, thus, contribute to understanding and predicting interpersonal behavior.

Although TIB and other theories (e.g., TRA and TPB) share common constructs such as attitudes, subjective norms, and behavioral intention, TIB has unique features in that it introduces distinctive elements such as emotional, habitual, and situational factors. The main idea of TIB and its relationships between its components are graphically indicated in Figure 1 below.

Figure 1

The Theory of Interpersonal Behavior (Triandis, 1977)



As shown in Figure 1, a particular behavior within interpersonal contexts is determined by three main factors – (a) behavioral intentions, (b) behavioral habits, and (c) facilitating conditions, and each has its sub-dimensions. Each component of TIB is explained in the following sections.

Behavioral Intention

Behavioral intention (BI) refers to an individual's intent and willingness to perform a specific behavior (Triandis, 1977). It represents conscious decision and deliberate willingness aspects of an action (i.e., rational reasoning on whether to behave; Pee et al., 2008; Triandis, 1977). Behavioral intention is considered a critical proximal determinant of actual behavior. (Milhausen et al., 2006; Moody & Siponen, 2013; Pee et al., 2008).

Antecedents of behavioral intention. Triandis (1977) argues that behavioral intention is linked to three sub-components: (a) attitudinal (i.e., cognitive), (b) social, and (c) affective factors.

Attitudes. *Attitudes* in TIB refer to a person's cognitive beliefs and evaluations about engaging in a specific behavior (Triandis, 1977). These attitudes are subjective feelings and evaluations (either positive or negative). According to TIB, attitudes directly influence behavioral intentions, and these intentions, in turn, lead to an ultimate behavior. In other words, attitudes toward a behavior indirectly influence an actual behavior through behavioral intentions. To be specific, in shaping a person's overall attitudes toward a behavior, perceptions of the outcomes – outcome beliefs and outcome evaluations – play a crucial role in TIB (Triandis, 1977).

Outcome beliefs are a person's beliefs or expectations regarding behavioral consequences (Triandis, 1977). When an individual performs, such beliefs are either positive or negative. Positive attitudes are shaped when a person holds positive outcome beliefs toward a behavior. Negative outcome beliefs lead to negative attitudes toward a behavior. For example, suppose people believe that frequent calling or texting increases relationship quality. In that case, they may develop positive attitudes toward active interactions and communication through their phones. However, when they believe such constant interactions to be unhealthy and potentially harmful to their relationships, individuals are likely to

develop negative attitudes toward constant computer-mediated communication with their partners.

Outcome evaluations indicate a person's judgment about whether a particular behavior's consequences are desirable or undesirable (Triandis, 1977). Similar to the outcome beliefs, positive outcome evaluations shape positive attitudes toward a behavior, whereas negative outcome evaluations lead to negative attitudes. For instance, when people evaluate that constant interactions lead to favorable outcomes, such as allowing their partners to feel cared for and valued and expecting their relationships to be reinforced, they hold positive attitudes about constant contact with their partners. Conversely, if people perceive constant interactions as leading to negative results, such as anticipating that others feel surveillance and obsession, they develop negative attitudes toward such behavior.

Social factors. TIB also points out that *social factors* directly impact intentions to engage in a behavior. In other words, whether people engage in a certain behavior is heavily dependent on perceptions of how others think and behave in their group and society (Asch, 1951; Milgram, 1983). According to the TIB, these social factors comprise three sub-dimensions: norms, roles, and self-concept (Triandis, 1977).

Norms are shared rules and expectations of behaviors within a group or society (Triandis, 1977). As social standards, they guide and regulate an individual's behaviors (i.e., what individuals should and should not do), and thus, behaviors become predictable in a given situation (Egmond & Bruel, 2007). These unwritten agreements are applied to all the individuals within the relevant group, and they are expected to act under the norms (Ajzen, 1985). However, because they are not laws, the degree to which people accept and follow such norms can differ. Someone can break and show strange behaviors that are deviant from the norms. Nonetheless, these unwritten behavioral norms increase the probability that an individual will conform to the norms to avoid the negative consequences caused by breaking

the norms (Madden et al., 1992). For instance, when social expectations and atmosphere prompt responses to text messages are respectful between romantic partners, individuals are likely to check and use their phones promptly for texting to adhere to their social norms.

Roles indicate "… sets of behaviors considered appropriate for persons holding particular positions in a group" (Triandis, 1977, p. 8). They are the perceptions of whether behaviors are proper and acceptable to an individual's particular position or status within a group and society. People tend to perform depending on their social roles because of social pressure from their social positions (Triandis, 1977). In this regard, behaviors are predictable within the group because individuals in the same positions perform similarly. For instance, in most societies, students attend classes regularly, do assignments, and follow school rules. According to TIB, the prominence and salience of a particular social role primarily influence behavioral intentions. However, people hold various social roles simultaneously, and their behaviors differ depending on them. For instance, a person may be a part-time worker, student, daughter, sister, friend, leader of a study group, and a member of society. As a friend, she provides emotional support and help when another friend has challenging times. As a part-time worker, she arrives at her workplace on time and does her duties. Suppose she believes her family roles (as a daughter and sister) are highly salient. In that case, she seeks to spend time doing family-related activities over other social roles during holidays.

Self-concepts –a person's perceptions about themselves, such as how they define, perceive, and evaluate themselves in interpersonal interactions – directly impact behavioral intentions (Triandis, 1977). In TIB, self-concept is regarded as a construct of social factors rather than individual levels because people do not exist by being in isolation from others. The self-concept is inherently connected to social interactions and interpersonal relationships (Moody & Siponen, 2013). People decide whether they engage in a particular behavior based on how they consciously qualify and treat themselves in terms of the given behavior. That is,

as they identify themselves as those who behave in a certain way, they are likely to have strong intentions to behave in it. For example, suppose someone sees themselves as those who value personal and relational maintenance. This self-concept increases their intentions to have constant conversations with their partners.

Affect. Another significant factor contributing to behavioral intentions in TIB is *affect*. It refers to the emotional or affective reactions toward a behavior (Gagnon et al., 2003; Triandis, 1977). Such emotional responses are either positive (e.g., joy, pleasure, and warmth) or negative (e.g., disgust, depression, unpleasure, and guilt). Specifically, positive emotion increases the likelihood of developing intentions to engage in a particular behavior. However, individuals with negative affect toward a behavior are likely to have low behavioral intention. For example, if it is happy and enjoyable to have constant interactions with partners, people show stronger intentions to engage in such behavior. However, they intend to engage less in constant interactions when such behavior is perceived to be frustrating and stressful.

Habits

As mentioned earlier, one of the distinctive TIB features is the emphasis on the unconscious aspects of human actions. Along with intentions and the relevant factors discussed so far, Triandis (1977) considered habits to be a vital contributor to predicting a certain behavior. In TIB, *behavioral habits* reflect patterns of past behavior, and this factor directly influences any current behavior (Triandis, 1977; Verplanken & Orbell, 2003). As a form of automatic and routine responses, a particular behavior becomes habitual with repetition and in response to the same (or similar) cue in consistent contexts (Egmond & Bruel, 2007). As a result, individuals engage in a habitual tendency with less conscious thinking and effort. For instance, suppose someone usually calls their parents before bed. As

they repeatedly show such behavior, they become used to it and, thus, tend to call them without awareness.

Facilitating Conditions

Another distinctive characteristic of TIB, which enhances its predictive power of human behavior, is the inclusion of facilitating conditions. *Facilitating conditions* are situational and environmental conditions that either encourage or hinder the performance of a behavior (Milhausen et al., 2006). TIB points out the direct influence of facilitating conditions on actual human actions (Triandis, 1977). For instance, even if people strongly intend to engage in a desired behavior, they may be less likely to exhibit such behavior if their environmental circumstances do not support or enable this behavior.

In summary, according to TIB, behaviors in interpersonal interactions are predicted by behavioral intention, habit, and facilitating conditions (Triandis, 1977). For this study, these broad categories of factors from TIB are adapted to predict phubbing behavior by emphasizing both conscious and unconscious aspects.

Application of TIB Constructs to Phubbing

As phubbing is one of the human behaviors happening in interpersonal situations, the theoretical framework of TIB would be effective in understanding what factor motivates individuals to phub others. Thus, this study assumes the significance of the constructs from TIB in the context of phubbing behavior. Specifically, three broad factors – (a) behavioral intention, (b) habits, and (c) facilitating conditions – which are classified into conscious and unconscious aspects, play significant roles in predicting phubbing. The following sections apply and conceptualize each construct in the context of phubbing.

Phubbing Behavior

As defined earlier, this study conceptualizes *phubbing* as disregarding or treating interlocutor(s) and face-to-face interactions inattentively in favor of checking and using one's

phone. As predictors of phubbing behavior, the three components – intentions, affect, and facilitating conditions – are applied in this study. In this dissertation, these three components are phubbing intentions, affect toward phubbing behavior, and facilitating conditions. As the first predictor, *phubbing intentions* are conceptualized as a person's readiness and willingness to phub others. Three sub-variables determine phubbing intentions: (a) attitudes toward phubbing, (b) social factors of phubbing, and (c) affect toward phubbing.

Attitudes toward Phubbing

Attitudes toward phubbing refer to positive or negative evaluations of the potential outcomes of phubbing behavior. In the context of phubbing, individuals' attitudes toward phubbing determine their intention to perform phubbing. For instance, if someone believes that phubbing leads to positive consequences, they tend to show stronger intentions to engage in phubbing behavior. However, as people perceive that there would be adverse outcomes of phubbing behavior, it is less likely to exhibit intentions to phub others.

Social Factors of Phubbing

Individuals' perceptions about their groups and society and social factors – norms, roles, and self-concepts – influence their intentions to phub others. *Norms regarding phubbing* are individuals' perceptions of how others (e.g., friends, family, and people around them) view phubbing behavior. That is, they are social expectations of people toward phubbing behavior. *Social roles relevant to phubbing* represent how people perceive phubbing behavior on the basis of their positions and roles. It is a matter of perceptions about whether phubbing is appropriate to their social status. *Self-concepts relevant to phubbing* indicate individuals' beliefs and ideas about defining and seeing themselves as phubbers.

In line with the proposed relationships from TIB, this dissertation also predicts stronger intentions to engage in phubbing behavior with high levels of social norms, social roles, and self-concept regarding phubbing behavior; individuals believe phubbing behavior

to be socially accepted and perceived to be appropriate by others when phubbing is appropriate to their social roles and position or considers phubbing behavior to be consistent with their self-concepts (i.e., they regard phubbing as part of who they are), they tend to strong willingness to phub others.

Affect toward Phubbing

Affect toward phubbing indicates positive or negative emotional responses toward phubbing behavior and its consequences. As TIB suggests, this study expects a positive association between affect toward phubbing behavior and phubbing intention, such that individuals with positive emotions (e.g., enjoyment) towards phubbing behavior tend to have higher intentions to phub others.

Phubbing Habits

As an unintentional or automatic aspect of performance, past behavior or *habit* is another critical predictor that directly contributes to determining phubbing behavior. This study defines *phubbing habits* as the extent to which phubbing has become automated and routine to people. That is, phubbing habits reflect how frequently they phub before. Based on this conceptualization, this study assumes those who repeatedly showed phubbing behavior in their past are more likely to phub others.

Facilitating Conditions of Phubbing

Lastly, *facilitating conditions of phubbing* represent external environmental and situational contexts that induce phubbing behavior. As TIB argues, this study also considers such facilitators to be predictors of it. In other words, if particular conditions are present, such as allowing people to use their phones more freely and easily, they engage in phubbing behavior more.

Hypotheses and Conceptual Framework of the Research

Based on the application and conceptualization of each construct, this study develops hypotheses in the context of phubbing using TIB. Specifically, it considers how cognitive variables – attitudes toward phubbing behavior, social factors related to phubbing, and affect toward phubbing behavior – might influence a person's intention to phub others, leading to phubbing performance. In addition to this cognitive process, unconscious factors – phubbing habit and facilitating conditions – are examined to predict phubbing behavior.

Based on the above assumptions and literature review of TIB, this study provides the following rationales for hypotheses. According to TIB, positive outcome beliefs and evaluations contribute to forming overall positive attitudes toward a behavior, which, in turn, leads to behavioral intentions. In this regard, individuals who expect positive outcomes regarding phubbing or assess phubbing outcomes to be desired are likely to express stronger intentions to phub others. However, when individuals expect phubbing behavior to be unfavorable by predicting adverse outcomes and evaluations toward it, they tend to have negative attitudes toward it, which, in turn, translates into weaker intentions to phub others.

In addition, TIB asserts that behavioral intentions are influenced by social-relevant factors (i.e., norms, social roles, and self-concepts). In particular, there is a greater tendency to engage in phubbing among those who believe such behavior is socially acceptable and suitable within their groups and society. Those who strongly identify that their social roles are consistent with phone use in face-to-face interactions are likely to show stronger intentions to phub others. When individuals with positive self-concepts regarding phubbing may regard phubbing as consistent with their self-identity, they show strengthened phubbing intentions. Within the TIB framework, affect also contributes to behavioral intentions. This study rationalizes that individuals with positive emotional responses toward phubbing behavior tend to show stronger intentions to phub others. In contrast, those with negative

emotions toward phubbing are likely to have weaker intentions to perform phubbing behavior.

Taken together, behavioral intentions determined by attitudinal, social, and affectional factors and habits from TIB shape an actual behavior. In the context of phubbing, this study suggests that individuals with strong intentions tend to engage in more phubbing behavior. Those individuals with stronger phubbing habits phub others more often. Finally, TIB acknowledges the interplay between facilitating conditions and actual behavior. In this regard, strong facilitating conditions, such as the availability of smartphone use during face-to-face interactions, encourage phubbing behavior. Therefore, individuals who are exposed to such facilitating conditions phub others more frequently.

These lines of reasoning provide the following hypotheses. Based on the hypotheses from TIB, this study proposes a conceptual framework of the determinants of phubbing, illustrated in Figure 2.

H1. Attitudinal factors derived from outcome beliefs and outcome evaluations regarding phubbing behavior will be associated with phubbing intentions.

H2. Social factors derived from social norms, social roles, and self-concept relevant to phubbing behavior will be associated with phubbing intentions.

H3. Affect toward phubbing will be associated with phubbing intentions.

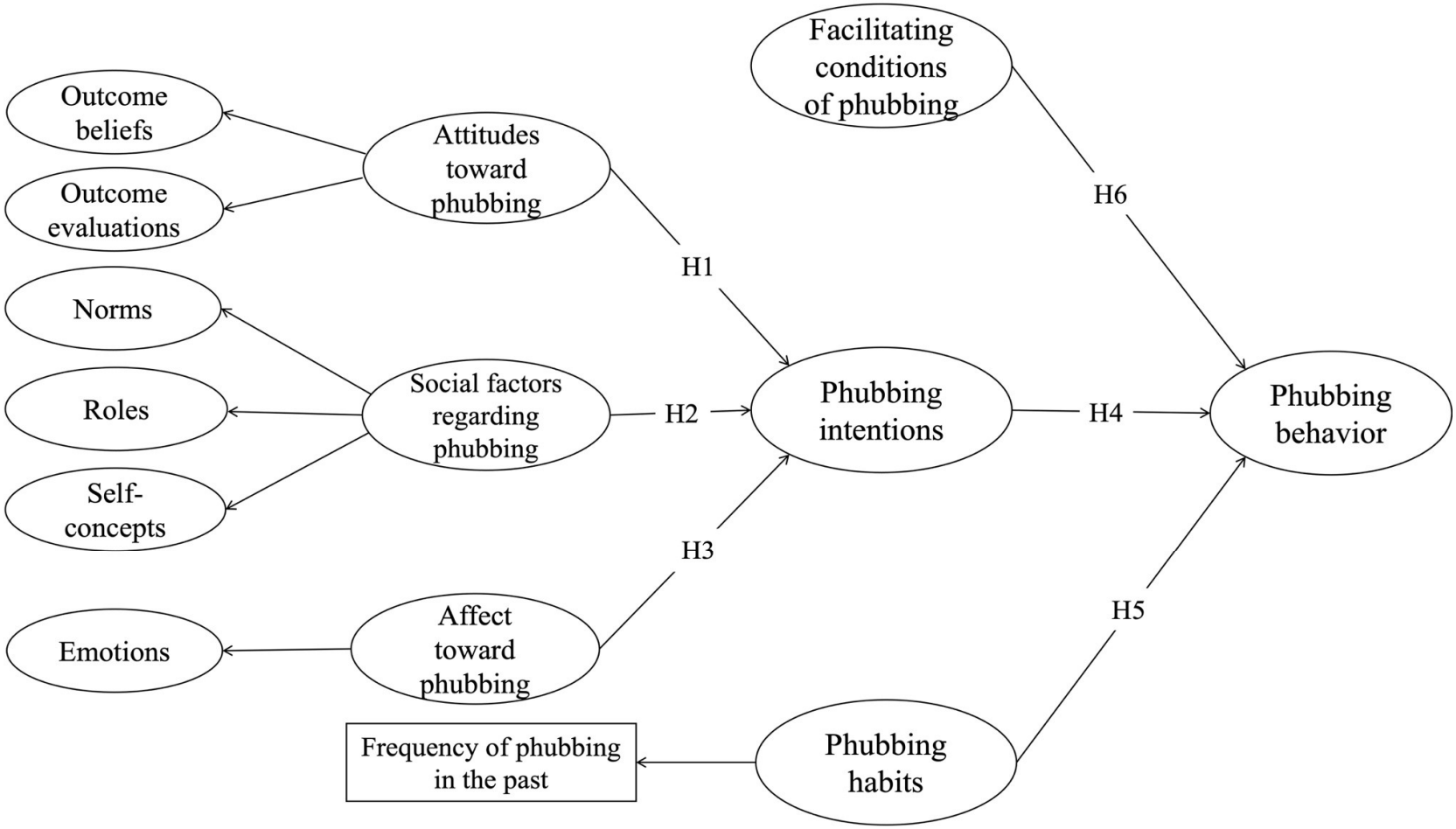
H4. Phubbing intentions will be associated with phubbing behavior.

H5. Phubbing habits will be associated with phubbing behavior.

H6. The presence of facilitating conditions will be associated with phubbing behavior.

Figure 2

Hypothesized Conceptual Framework



Chapter 3. Study 1 - Methods and Results

Many different factors in shaping a specific behavior are included in TIB. However, as mentioned earlier, there are no clear guidelines or existing scales to operationalize each construct from TIB, especially in response to phubbing behavior. Therefore, in Study 1, this research generated and tested scales that would be used to measure each construct of TIB in the context of phubbing. More specifically, as Boateng et al. (2018) noted, potential items for each scale were initially developed, and data were collected using those items. Then, each scale's factor structure and internal consistency were identified by conducting exploratory factor analysis (EFA) and Cronbach's alpha reliability tests, respectively. For this dissertation, a quantitative cross-sectional survey research design was used.

Scale Development Procedures

This study developed scales for measuring phubbing behavior and its relevant predictors, in alignment with TIB, expecting to provide comprehensive and accurate measurements to capture the multidimensional nature of phubbing. This study specifically followed Boateng et al.'s (2018) guidelines. According to them, there were three phases with nine steps for developing robust and effective measures: Phase I: Item development – Step 1: Identification of domain and item generation, Step 2: Content validity, Phase II: Scale development – Step 3: Pre-testing questions, Step 4: Survey administration and sample size, Step 5: Item reduction, and Step 6: Extraction of factors and Phase III: Scale evaluations – Step 7: Tests of dimensionality, Step 8: Tests of reliability, and Step 9: Tests of validity. All these steps were discussed in Chapters 3 (Study 1 – from Steps 1 to 6) and 4 (Study 2a – from Steps 7 to 9), respectively.

Step 1: Identification of Domain and Item Generation

The first step of scale development is identifying domains and generating items (Boateng et al., 2018). The domains of this study were articulated through existing literature

reviews on phubbing and TIB, as discussed in the literature review section of Chapter 2. This study clearly defined phubbing and how the relevant predictors suggested by TIB are conceptualized in the context of phubbing.

Based on the identified domains, this study overviewed the current field of literature (e.g., phubbing and studies using the framework of TIB in different contexts such as personal Internet use, recycling, and romantic relationship dissolution) to identify potential items for each construct and explored relevant scales. In addition, other scales that measure similar concepts (e.g., problematic mobile phone use) were reviewed for inspiration. As a result, a pool of potential items that were relevant to each construct was generated.

Step 2: Content Validity

In the second step, the created initial item pool should be evaluated through content validity to ensure that the generated items are representative and relevant measurement instruments (Boateng et al., 2018). This study invited four experts who are familiar with the topic of this study – that is, phubbing – at the author's institution and asked them to review the items and constructs thoroughly. Regarding the content validity of each measurement, they confirmed the domains of this study, evaluated each item's clarity, relevance, and conciseness, and then provided feedback. Their feedback suggested additional items that should be included but were not indicated. Based on their suggestions, this study refined and added items for better comprehension and clarity and removed some items that were perceived as confusing. After the revisions, a final set of items – 10 constructs with 102 items in total – was generated in Study 1. The following describes how critical literature and experts' reviews/suggestions helped to identify and develop each construct's items. Items indicated with an asterisk (*) are reverse-scored.

Phubbing behavior. Since the emergence of the term phubbing, a few scales have been developed and validated to measure the phubbing construct quantitively and

qualitatively with different focuses. Karadağ and colleagues (2015) developed a 10-item Phubbing Scale (PS) focusing on diverse addictions (e.g., mobile phones, SMS, social media, Internet, and games). Their candidate items were generated through focus group interviews. Through EFA of the initial pool of their items, PS was found to have two sub-factors: (1) *communication disturbance* – a disturbance in existing communication due to phone use and (2) *phone obsession* – a need for a mobile phone in lacking face-to-face situations.

Based on the PS scale, Chotpitayasunondh and Douglas (2018) developed and validated the Generic Scale of Phubbing (GSP) a few years later. Their scale specifically focused on psychological factors of phubbing. Through EFA and CFA, it was found that their final 15-item GSP was clustered into four dimensions: (1) *nomophobia* – feelings of fear without their phones nearby, (2) *interpersonal conflict* – conflicts between individuals and others due to phubbing behavior, (3) *self-isolation* – phubbing to escape from social activities and isolate themselves, and (4) *problem acknowledgment* – recognition of phubbing problems. Although these two scales have been frequently used in previous studies with high validity and reliability, they do not capture phubbing behavior, per se. It is also necessary to consider the specific conditions triggering phubbing behavior. Thus, this study generated a pool of 16 items to measure one's phubbing behavior by extending the existing scales into specific situations of phubbing and adding negatively worded items.

Table 1

Initial Scale Items for Phubbing Behavior

Instruction: Please answer the following question about your experience using your phone when you are with other(s). Read the following statements carefully and then indicate the degree to which you agree or disagree with the statements below.	
Item Statement	Sources
I usually have my phone within easy reach when I am with other individuals.	
I am always busy doing something on my phone.	

When my phone rings or buzzes, I usually check it even if I am in the middle of a conversation with someone Other people often tell me to put my phone away when I am with them. *I rarely carry my phone in my hand especially if I am with someone. *I barely understand what others around me are saying while also using my phone. *I rarely glance at my phone in the middle of a conversation. * I never check my phone without a particular reason especially when I am with someone.	Developed based on Chotpitayasunondh & Douglas (2018); Karadağ et al., (2015)
I believe I can carry on two conversations at once, one on my phone and the other one in person, with someone. I sometimes find myself mindlessly scrolling through my phone even when I am with other people. I sometimes respond to my conversation partner with very few words (e.g., "yeah", "uh-huh", and "right") because I am using my phone. Every time notifications show up on my phone, I check them even if I am having a conversation with someone. When I spend time with someone, I worry about missing important calls or messages. I feel relieved when I stay connected with someone through social media or texting. It is difficult to pay attention to a conversation or conversational partner due to the mere presence of my phone. *I am not concerned with being unresponsive to incoming calls and/or messages when I am spending time with someone.	Developed based on signs and examples of phubbing behavior

Outcome beliefs and evaluations toward phubbing. The scale items for outcome beliefs and evaluations toward phubbing were developed through in-depth literature reviews investigating the consequences of phubbing behavior. According to existing phubbing studies, one's phubbing behavior negatively influences partners by damaging their feelings and making them feel ignored and excluded (Beukeboom & Pollmann, 2021). Phubbing also undermines social interactions and relationship satisfaction (Chotpitayasunondh & Douglas, 2018; Roberts & David, 2016). Although it is obvious that phubbing leads to detrimental consequences in people's social lives, this dissertation further considered other possible

outcomes because it is possible for someone to hold positive attitudes toward phubbing. That is, they believe phubbing is a part of multitasking behavior and thus leads to positive consequences. They perceive themselves as good multitaskers in managing both things simultaneously (i.e., handling face-to-face interactions and tasks that should be done through their phones). For example, suppose a person receives text messages from his friend while having dinner with his girlfriend. By responding to the messages in the presence of his girlfriend, this phubber may think that he takes care of and fulfills his friend's and girlfriend's needs at once. In this regard, the advantages of multitasking were explored and considered.

In this dissertation, the initial set of outcome beliefs toward phubbing, based on the literature, consisted of 12 items (Table 2). Subsequently, these 12 items created to measure outcome beliefs were used to develop an outcome evaluations scale for phubbing. Each item was measured for whether individuals would perceive the associated outcomes as favorable or unfavorable, resulting in the scale presented in Table 3.

Table 2

Initial Scale Items for Outcome Beliefs toward Phubbing

Instructions: The following statements describe some possible outcomes of your phone use during face- to-face interactions. Please read each statement carefully and then rate the extent to which you expect each of the following statements to happen as a result of your phone use when you are with others.	
Item Statement	Sources
*Reducing my social skills *Hurting my relationship with my conversational partner *Hurting my conversational partner's feelings *Making my conversational partner feel awkward *Making my conversational partner feel excluded *Decreasing the quality of conversations with my conversation partner	Developed based on Beukeboom & Pollmann (2021); Chotpitayasunondh & Douglas (2018); Roberts & David (2016)
Saving some time. Keeping up with the latest information. Having a more interesting social life	Developed by considering phubbers as multi-taskers

Increasing the quality of my interpersonal relationships
Increasing my social productivity
Extending my social networks

Table 3

Initial Scale Items for Outcome Evaluations toward Phubbing

Instructions: Please rate the extent to which you would find these possible outcomes of your phone use during face-to-face interactions unfavorable to favorable	
Item Statement	Sources
*Reducing my social skills is _____. *Hurting my relationship with my conversational partner is _____. *Hurting my conversational partner's feelings is _____. *Making my conversational partner feel awkward is _____. *Making my conversational partner feel excluded is _____. *Decreasing the quality of conversations with my conversation partner is _____.	Developed based on Beukeboom & Pollmann (2021); Chotpitayasunondh & Douglas (2018); Roberts & David (2016)
Saving some time is _____. Keeping up with the latest information is _____. Having a more interesting social life is _____. Increasing the quality of my interpersonal relationships is _____. Increasing my social productivity is _____. Extending my social networks is _____.	Developed by considering phubbers as multi-taskers

Social norms regarding phubbing. For measuring social norms regarding phubbing, this study explored existing scales measuring both descriptive and injunctive social norms toward a specific behavior. For instance, Fishbein and Ajzen (2011) highlighted the importance of approval and prevalence in predicting behavior. Based on their argument, Borsari and Carey (2003) developed and validated an instrument for assessing social norms influencing college students' drinking behavior. In addition, Semanko (2021) created items to assess how perceived norms influenced relationship termination with committed romantic partners. Inspired by their approaches, this study created ten items involving descriptive and injunctive social norms in phubbing behavior by specifying the characteristics of such behavior, as indicated in Table 4 below.

Table 4

Initial Scale Items for Social Norms regarding Phubbing

Instructions: Please read each item carefully and indicate how much you agree or disagree with the following statements.	
Item Statement	Sources
Most people around me would think it is appropriate to pull out my/their phone(s) and check it while engaged in a conversation. Most people around me would consider it appropriate to send text messages or emails to others while engaged in a conversation. Most people around me would consider it appropriate to pull my/their phone(s) when it rings or beeps, even if they are in the middle of a conversation. Using one's phone in a social setting (i.e., face-to-face conversation) is prevalent in my social circles. Using one's phone in a social setting (i.e., face-to-face conversation) is common in my social circles. Using one's phone in a social setting (i.e., face-to-face conversation) is typical in my social circles.	Developed based on Fishbein & Ajzen (2011) and Semanko (2021)
I know situations in which people check their phones in the middle of conversations. I know situations in which people send text messages to someone else in the middle of their conversations. I know situations in which people take out their phones when they ring or beep. I know situations in which people turn to their phones when there are lulls in their conversations.	Developed based on the experts' reviews

Social roles relevant to phubbing. This study explored possible social roles people can have and designed to measure their behavior according to their roles. In Semanko's (2021) study, he listed specific social roles that would influence breaking up behavior, such as a worker, a college student, and a female. Inspired by his approach and experts' suggestions, before participants in this dissertation were asked to answer the scale of social roles relevant to phubbing, they were asked to choose the most salient social role at that moment. They were provided with a list of possible social roles as follows: "a friend to someone," "a romantic partner to someone," "a college student," "a parent," "a son or

daughter," a working person," and "another role." Then, for social roles relevant to phubbing, six items were created to measure whether they perceived phubbing behavior as proper and appropriate according to their dominant social role (Table 5).

Table 5
Initial Scale Items for Social Roles Relevant to Phubbing

Item Statement	Sources
I consider it appropriate to use my phone when I am with others. I find it fitting to use my phone when I am with others. I believe it is proper to use my phone when I am with others. I consider it appropriate to use my phone when I am with my friend or partner. I find it fitting to use my phone when I am with my friend or partner. I believe it is proper to use my phone when I am with my friend or partner.	Developed based on Semanko (2021)

Self-concept relevant to phubbing. This study reviewed existing studies to develop the measurement of self-concept relevant to phubbing. In Semanko's (2021) study, he created three items for self-concept in breaking up behavior (e.g., "Are you the kind of person who would break up with their committed romantic partner within the next six months?"). Inspired by his approach and the experts' suggestions, this study developed a 5-item scale to assess self-concept relevant to phubbing behavior, as indicated in Table 6 below.

Table 6
Initial Scale Items for Self-Concepts relevant to Phubbing

Instructions: Please read each item carefully and indicate how much you agree or disagree with the following statements.	
Item Statement	Sources
I am the kind of person who would use their phone when others talk to me. I am the kind of person who would use their phone during a typical mealtime with my friends or family.	Developed based on Semanko (2021)

I feel I would become more of who I am if I used my phone when I am with others.	
It is easy to imagine myself as a person who uses their phone in the middle of a conversation with others. Using my phone when I spend time with others is part of my personality.	Developed based on the experts' reviews

Affect toward phubbing. This study explored people's possible emotions toward a behavior to generate items for the affect toward the phubbing scale. Specifically, Triandis (1977) suggests that certain behaviors provoke positive or negative feelings such as joy, pleasure, depression, and anxiety. Limayem et al. (2004) developed a scale to measure emotions when using software piracy. For instance, they included six emotions – wrong, exciting, unethical, amusing, wise, and valuable to measure feelings regarding piracy. Semanko (2021) also created items to measure emotions toward breaking up with one's romantic partner behavior by including comfortable, exciting, boring, happy, sad, pleasing, and heart-breaking descriptors. Inspired by their approaches, specific feelings about phubbing behavior were explored in this study. Consequently, this study created ten items to measure individuals' emotional responses to phubbing behavior (Table 7).

Table 7

Initial Scale Items for Affect toward Phubbing

Instructions: The following questions ask about your feelings about using your phone while engaging in interpersonal interactions. Please read each item carefully and indicate the extent to which you agree with each statement.	
Items	Sources
I find it exciting to use my phone when I am with others. I find it pleasing to use my phone when I am with others. It is enjoyable to use my phone when I am with others. Using my phone when I am with others relieves my stress. I feel comfortable using my phone when I am with others.	Developed based on Limayem et al. (2004), Semanko (2021), and Triandis (1977)
*It is selfish to use my phone when I am with others. *Using my phone when I am with others is disrespectful. *I feel guilty using my phone in the middle of a conversation.	Developed based on how people

*Using my phone when I am with others is shameful. *It is foolish to use my phone when I am with others	generally feel toward phubbing

Phubbing habits. After conducting an in-depth review of the literature, this dissertation discovered scales measuring frequency, routine, and habit strength. For instance, the Self-Report Habit index by Verplanken & Orbell (2003) measures the degree to which a specific behavior has become habitual and strengthened. This scale includes the following key components: "automatic," "frequency," and "do for a long time." Inspired by their study, items were developed to assess habitual tendencies to hub others. Following experts' reviews, a pool of 12 items was created (Table 8).

Table 8

Initial Scale Items for Phubbing Habits

Instructions: Recall your past face-to-face interactions with others. Then, read each item carefully and indicate the extent to which you agree with each statement with regard to yourself.	
Item Statement	Sources
I frequently find that I can't focus on what others are saying because I am on my phone. I frequently find myself checking my phone for messages and social media updates when I am with others. I automatically check my phone when I get pop-up notifications even in the presence of others. I use my phone almost every day when I am with others. I always use my phone when I spend time with others. I often find myself using my phone when I am with my friends just because it is lying there. I find myself paying attention to my phone for longer than I intend to while spending time with others.	Developed based on Verplanken& Orbell (2003)
It is becoming a habit for me to use my phone while I am out with others. It is normal for me to use my phone without explicitly planning to do so when I spend time with others. It is natural for me to check my phone while spending time with others. Using my phone in the presence of others is a part of my life.	Developed based on Limayem et al. (2007)

When there is silence during a conversation with others, using my phone is an obvious choice for me.

Facilitating conditions of phubbing. This study generated a pool of potential facilitating conditions of phubbing scale through prior literature, the author's own experience, and observations of phubbers. Specifically, this study explored several studies specifically examining when and in which situations individuals were likely to show phubbing behavior more frequently; people are more likely to phub others when they are with close others such as friends and family (Al-Saggaf & MacCulloch, 2019); their partners are distracted by their phones (i.e., they are being phubbed by their partners, Li, 2023); they get bored during face-to-face conversations with others; zone out (Al-Saggaf et al., 2019); and their phones ring or beep and there is a lull in face-to-face conversations (Roberts & David, 2016). In addition, through personal observations and experiences, it was noted that individuals phubbed others in the following situations: when people wish to avoid potentially contentious or uncomfortable topics and when they are in a group setting. Following experts' reviews and refinement, this dissertation developed 12 items to measure conditions that facilitate individuals to phub others (Table 9).

Table 9

Initial Scale Items for Facilitating Conditions of Phubbing

Instructions: The following statements present some possible conditions that influence your phone use when you are with others. Imagine that you are under the following conditions and then indicate the extent to which you use your phone when you spend time with others, especially…	
Item Statement	Sources
When I get bored When a conversation is not interesting anymore When the conversation is at a lull When my phone rings or beeps When I am with my family When I spend time with my friends When my conversation partner uses his/her phone	Developed based on Al-Saggaf & MacCulloch (2019); Al-Saggaf et al. (2019); Li (2023); Roberts & David (2016)

When I zone out	
When I just need a break from the conversation When I am in a group of people (e.g., more than three people including me). If an argument or disagreement with my conversational partner develops. When a conversation does not require my full attention.	Developed through observations and experiences

Phubbing intentions. This study conducted a thorough literature review to generate items to measure individuals' phubbing intentions. This study reflected Moody and Siponen's (2013) approach to measuring intentions to use the Internet. In addition, the experts suggested generating four more items that indicated the possible phubbing situations, as demonstrated in previous studies (e.g., Al-Saggaf et al., 2019; Roberts & David, 2016). These newly added items provided the possible situations that may facilitate phubbing behavior and indicated how willing individuals would be to phub others. This study yielded seven items for measuring phubbing intentions, as indicated in Table 10 below.

Table 10

Initial Scale Items for Phubbing Intentions

Instructions: The following questions are about your willingness to use your phone when you are with others. Please rate how strongly you agree or disagree with the following statement.	
Item Statement	Sources
Whenever possible, I intend to use my phone when I am with others. To the extent possible, I would check my phone in the middle of a conversation with others. I plan to increase my phone use when I am with others in the future.	Developed based on Moody & Siponen (2013)
When there is a lull in the conversation, I am likely to use my phone. Assuming I get a notification, I would check my phone even during a conversation with others. When I become bored, I am likely to use my phone to find something fun. I am likely to check my phone to withdraw from the situation if I am unwilling to engage in a conversation with others.	Developed based on the experts' reviews

Steps 3 and 4: Pre-testing Questions and Survey Administration and Sample Size

In the third step (i.e., pre-testing questions) (Boateng et al., 2018), this study reviewed the items to ensure they captured the domain of interest and included meaningful statements. The following describes the procedures and measures employed in Study 1. Then, surveying the initial set of items was included in the fourth stage using a large enough representative sample (Boateng et al., 2018). This dissertation collected the data from a representative crowdsourcing platform through a cross-sectional approach as part of this procedure. The following paragraphs detail the participants, procedures, and analyses conducted for Study 1.

Measures

Participants of Study 1 were asked to score how much they agreed or disagreed with the statements provided to them based on their own experiences using their phones in interpersonal situations. All items are presented in Tables 1-10. They were rated on a 5-point Likert-type scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*.

Phubbing behavior. Participants were first asked to respond to questions regarding their phubbing behavior. An initial pool of 16 items, including five reverse-coded items for the phubbing scale, was developed to reflect an individual's phubbing behavior and represent their phubbing experience. For the questions about phubbing behavior, respondents were provided with the following instructions: "When it comes to *phone* in the following statements, it generally indicates *smartphone* that combines the features of mobile phone and computer such as iPhone, Galaxy, etc.". The items they rated afterward included: "I usually have my phone within easy reach when I am with other individuals," "When I spend time with someone, I worry about missing important calls or messages," and "I rarely carry my phone in my hand especially if I am with someone (R)."

Outcome beliefs toward phubbing. Participants were then asked to indicate their perceived outcomes of phubbing through outcome beliefs and evaluations. An initial pool of 12 items, of which six were reverse-coded, was included for outcome beliefs. Examples of outcome beliefs toward phubbing were: Using my phone during face-to-face interaction with others will result in… "saving some time," "keeping up with the latest information," "having a more interesting social life," and "reducing or diminishing (one, not both) my social skills (R)."

Outcome evaluations toward phubbing. An initial pool of 12 items, of which six were reverse-coded, was created to measure outcome evaluations toward phubbing. Examples of outcome evaluations toward phubbing were: "keeping up with the latest information is ____," "Extending my social networks is _____," and "Reducing my social skills is _____(R)."

Social norms regarding phubbing. Social norms regarding phubbing were assessed with both injunctive and descriptive norms. Ten items were developed – three for injunctive social norms and seven for descriptive social norms – to assess normative perceptions toward phubbing behavior. Examples of injunctive social norms were "Most people around me would think it is appropriate to pull out my/their smartphone(s) and check it while engaged in a conversation," "Most people around me would consider it appropriate to send text messages or emails to others while engaged in a conversation" and "Most people around me would consider it appropriate to pull my/their smartphone(s) when it rings or beeps, even if they are in the middle of a face-to-face conversation." Examples of descriptive social norms regarding phubbing were: "I know situations in which people check their phones in the middle of conversations," "Using one's phone in a social setting (i.e., face-to-face conversation) is prevalent in my social circles," and "Using one's phone in a social setting (i.e., face-to-face conversation) is common in my social circles."

Social roles relevant to phubbing. Participants were asked to indicate how their social roles influenced their phubbing behavior. For this measurement, six different social roles that individuals might have (e.g., a friend of someone, a romantic partner of someone, and a college student) were listed. Participants were then asked to choose the most salient for them at the time. With their social roles, respondents were asked to indicate how appropriate phubbing behavior was for their chosen social position or role. Example items were: "I (as social role chosen by the participants) consider it appropriate to use my phone when I am with others," "I find it fitting to use my phone when I am with others," and "I believe it is proper to use my phone when I am with others."

Self-concepts relevant to phubbing. A 5-item self-concept scale was developed to measure how individuals perceived themselves as phubbers. Example items were: "I am the kind of person who would use their phone when others are talking to me," "I am the kind of person who would use their phone during a typical mealtime with my friends or family," and "I feel I would become more of who I am if using my phone when I am with others."

Affect toward phubbing. This study proposed ten emotions to measure individuals' affect toward phubbing behavior (with five positive and five negative feelings). Participants were asked explicitly to express the extent to which they agreed that feeling described them. For example, items in this scale were: "I find it exciting to use my phone when I am with others," "Using my phone when I am with others is disrespectful (R)," and "Using my phone when I am with others relieves my stress."

Phubbing habits. This study developed a 12-item habitual phubbing behavior scale to measure the strength of habitual behavior toward phubbing. Example items were: "I always use my phone when I spend time with others," "It is normal for me to use my phone without explicitly planning to do so when I spend time with others," and "I use my phone almost every day when I am with others."

Facilitating conditions of phubbing. This study proposed 12 conditions that make it easy to show phubbing behavior. For example, participants were asked to indicate how much they were likely to use their phone in the following situations: "When I get bored," "When my phone rings or beeps," and "When the conversation is at a lull."

Phubbing intentions. A 7-item phubbing intention scale was created for this study to assess participants' phubbing intentions. Example items of this scale are: "Whenever possible, I intend to use my phone when I am with others," "To the extent possible, I would check my phone in the middle of a conversation with others," and "I plan to increase my phone use when I am with others in the future."

Participants

Tabachnick and Fidell (2013) suggested having at least 300 responses to conduct factor analysis as rule of thumb. In this dissertation, 350 individuals were recruited and consented to participate in Study 1. In the process of data cleaning, it was found that one case included missing values. Therefore, it was eliminated from the data, and the final sample became 349. Participants' ages ranged from 18 to 56 years old (M_{age} = 33.81, SD_{age} = 8.13). Many had a 4-year college degree (37.8%), and nearly half were full-time workers (44.1%). Table 11 below provides additional demographic information.

Participants were recruited through Prolific (www.prolific.com), a crowdsourcing platform allowing researchers to collect high-quality questionnaire data with significant and reliable responses. For Study 1, eligibility was restricted to (a) people who were 18 or older, (b) a resident of the United States, and (c) have smartphones. This study specifically targeted participants living in the United States to reduce the possible effects of cultural differences on phubbing behavior, which is beside the point of this dissertation. Participants also needed to be smartphone users as phubbing is relevant to phone use in face-to-face interactions.

Table 11

Sample Characteristics of Study 1 (N = 349)

Demographics		Frequency (*n*)	Percentage (%)
Gender	Male	196	56.2%
	Female	138	39.5%
	Transgender	8	2.3%
	Others	3	0.9%
	Prefer not to answer	4	1.1%
Age	18-24 years old	56	16.0%
	25-34 years old	138	39.5%
	35-44 years old	107	30.7%
	45-54 years old	47	13.5%
	Over 55	1	0.3%
Ethnicity/Race	White/Caucasian	233	66.8%
	Hispanic/Latino/Latina	27	7.7%
	Black/African American	23	6.6%
	Asian	37	10.6%
	Native American/American Indian	3	0.9%
	Native Hawaiian/Pacific Islander	1	0.3%
	A combination of some of the above	18	5.2%
	Another ethnicity/race	3	0.9%
	Prefer not to answer	4	1.1%
Education level	High school degree or less	68	19.5%
	Some college	80	22.9%
	2-year college degree	33	9.5%
	4-year college degree	132	37.8%
	Professional degree	4	1.1%
	Graduate degree (e.g., M.A., Ph.D.)	30	8.6%
	Other	1	0.3%
	Prefer not to answer	1	0.3%
Occupation	Student	30	8.6%
	Unemployed	55	15.8%
	Not in paid work (e.g., homemaker, retired, or disabled)	24	6.9%
	Self-employed	48	13.8%
	Part-time	27	7.7%
	Full-time	154	44.1%
	Others	7	2.0%
	Prefer not to answer	4	1.1%
	0 - $24,999	117	33.5%

Annual Household income (USD)	$25,000 - $49,999	95	27.2%
	$50,000 - $74,999	52	14.9%
	$75,000 - $99,999	33	9.5%
	$100,000 - $149,999	26	7.4%
	$150,000 or more	13	3.7%
	Prefer not to answer	13	3.7%
Are you a smartphone user?	Yes	349	100%
	No	0	0.0%

Procedures

Eligible participants first read a description of the study on the Prolific platform. The recruitment message informed participants of the purpose of the study and the potential benefits/risks of participation. The participants were also notified that they could leave the survey at any time and that the results reported in this dissertation and any relevant publication would not include identifying personal information. Then, they were asked to indicate their consent to participate in the study. If they indicated "I wish to participate," participants could access the online survey designed for Study 1 that was hosted on Qualtrics.

The questionnaire began with their smartphone usage patterns (e.g., daily duration of smartphone use). Participants were then asked to complete a series of instruments by indicating their level of agreement with items measuring phubbing behavior, attitude toward phubbing (i.e., outcome beliefs and outcome evaluations toward phubbing), social factors (i.e., social norms regarding phubbing, social roles relevant to phubbing, and self-concepts relevant to phubbing), habitual phubbing, and facilitating conditions. At the end of the survey, participants were asked to answer demographic questions (e.g., age, gender, and ethnicity), and they were asked to indicate their opinions about the questionnaires via open-ended questions (e.g., "Please tell us if you have any comments about our survey such as scales and items/statements). A thank-you message appeared when the participants submitted their responses. On average, participants spent approximately 17 minutes to complete the

questionnaire. Data were collected on March 24 (Friday), 2023. Those who completed the questionnaire successfully were paid $3.34 (USD). The Institutional Review Board approved this research at the author's university.

Steps 5 and 6: Item Reduction and Extraction of Factors

Item reduction analyses and factor extraction for the optimal number of factors that fit the pool of items were conducted as the fifth and sixth steps of scale development (Boateng et al., 2018). Exploratory factor analysis (EFA) is commonly used with factor loadings (Boateng et al., 2018).

In this dissertation, before conducting EFA, Kaiser- Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity were performed to assess whether the data were suitable to conduct factor analysis (Hair et al., 2010; Tabachnick & Fidell, 2013). The KMO evaluates the degree of variance in observed indicators explained by latent factors, with higher values representing better suitability for factor analysis (Kaiser, 1974). Bartlett's test assesses whether a correlation matrix of variables significantly differs from an identity matrix, indicating sufficient intercorrelation among variables (Bartlett, 1950). To be considered appropriate for EFA, the KMO measure should be .70 or higher (Hair et al., 2010). Bartlett's test should be significant ($p < .05$) to reject the null hypothesis that the correlation matrix is the identity matrix (Bartlett, 1950).

EFA with principal component analysis (PCA) extraction with varimax (orthogonal) rotation was conducted on each scale in this dissertation. PCA with varimax rotation was used because it is a fast, stable, and practical way to find meaningful dimensions (Jolliffe, 2002; Rohe & Zeng, 2023). More specifically, PCA extraction was chosen to reduce the dimensionality of each scale in that it allows the transformation of potentially correlated variables into a smaller number of uncorrelated principal components (Tabachnick & Fidell,

2013). In addition, varimax rotation was used because it maximizes the dispersion of factor loadings and makes clusters more interpretable (Field, 2009).

Based on the extracted factor structure of each scale, this study used the following criteria to determine whether to keep or drop items as Hair et al. (2010) and Tabachnick and Fidell (2013) recommend: (a) eigenvalue of a factor (i.e., determine the number of factors, representing the amount of variance explained by a factor extracted from a correlation matrix of observed variables) greater than 1; (b) factor loadings (i.e., identify the direction and strength of the relationship between observed and latent factors extracted through factor analysis) greater than .50, and (c) no cross-loadings.

Results – Exploratory Factor Analysis (EFA)

In this dissertation, EFA with PCA extraction and varimax rotation was conducted for each scale included in Study 1 to ensure the dimensionality and factor structure specific to each measurement instrument.

Phubbing Behavior

The KMO and Bartlett's test of sphericity results showed that the data were suitable for EFA as χ^2 (120) = 1707.81, $p < .001$, and KMO = .85. Next, EFA was performed with 16 items measuring an individual's phubbing behavior. The results revealed that out of the 16 items, eight items were excluded from the data. To be specific, the group of five negatively worded items (i.e., PHUB_2, PHUB_4, PHUB_7, PHUB_11, and PHUB_14; "I rarely carry my phone in my hand especially if I am with someone," "I never check my phone without a particular reason, especially when I am with someone," "I am not concerned with being unresponsive to incoming calls and messages when I am spending time with someone," "I barely understand what others around me are saying while also using my phone," and "I rarely glance at my phone in the middle of a conversation") loaded onto a single factor. Since

negatively worded items may influence scale homogeneity and reliability negatively (Roszkowski & Soven, 2010), these five negatively worded items were eliminated.

Additionally, other three items (i.e., PHUB_1, PHUB_13, PHUB_16; "I usually have my phone within easy reach when I am with other individuals," "When I spend time with someone, I worry about missing important calls or messages," and "When my phone rings or buzzes, I usually check it even if I am in the middle of a conversation with someone") were removed from the scale because of their low factor loadings and cross-loadings. Then, another EFA was repeated with the remaining pool of 8 items, and they were placed into a single factor, explaining 51.87% of the total variance (eigenvalue = 3.35).

Outcome Beliefs toward Phubbing

With 12 items (six positive and negative outcome beliefs) of outcome beliefs, Bartlett's test of sphericity was significant, χ^2 (66) = 3011.97, $p < .001$, and KMO was .91. As a result, it was determined that the data were sufficient for conducting EFA. The results of the first run of the EFA on the outcome belief showed two sub-factors with Eigenvalues larger than 1, which accounted for 68.97% and 64.17%, respectively. Two items were deleted from both scales due to their poor factor loadings (i.e., BELIEF_1 and BELIEF_7; "Saving some time" and "Hurting my relationship with my conversational partner"). EFA was conducted again with the remaining pool of ten items for outcome beliefs. The second run of the EFA produced two factors: factor 1 consisted of the negatively worded items (i.e., BELIEF_4, BELIEF_8, BELIEF_9, BELIEF_10, and BELIEF_12), whereas all the positively worded items were included in factor 2 (i.e., BELIEF_2, BELIEF_3, BELIEF_5, BELIEF_6, and BELIEF_11). The eigenvalue for the first factor was 5.39, and the second-factor eigenvalue was 1.70, with 70.93% explaining total variance.

Outcome Evaluations toward Phubbing

With 12 items (six positive and negative outcome evaluations) of outcome evaluations toward phubbing, Bartlett's test of sphericity was significant: χ^2 (66) = 2461.85, $p < .001$, and KMO was .85. The initial EFA results showed that outcome evaluation measurement had two factors divided based on the positive and negative worded items, but two items were dropped from the scale due to their poor factor loadings (i.e., EVAL_1 and EVAL 7; "Saving some time is ____" and "Hurting my relationship with my conversational partner is ____"). A second EFA was performed on the remaining ten items. It was found that the scale had two sub-factors, with 66.01 % explained total variance (factor 1 – EVAL_4, EVAL_8, EVAL_9, EVAL_10, and EVAL_12 with eigenvalue = 2.90; factor 2 – items EVAL_2, EVAL_3, EVAL_5, EVAL_6, and EVAL_11 with eigenvalue = 3.70).

Social Norms Relevant to Phubbing

The appropriateness for conducting the EFA was confirmed by Bartlett's test of sphericity and KMO: χ^2 (45) = 2259.87, $p < .001$, KMO = .88. An analysis of EFA revealed that this 10-item scale measuring social norms toward phubbing behavior included four problematic items such as low factor and cross-factor loadings (i.e., SN_4, SN_7, SN_8, and SN_10; "I know situations in which people check their phones in the middle of conversations," "I know situations in which people send text messages to someone else in the middle of their conversations," "I know situations in which people take out their phones when they ring or beep," and "I know situations in which people turn to their phones when there are lulls in their conversations"), which in turn were eliminated from the scale. A second EFA was performed on the remaining six items, and it was found that the scale was unidimensional, with 66.11 % explained total variance (eigenvalue = 3.97).

Social Roles Relevant to Phubbing

Barlett's test of sphericity was found to be significant. KMO was also above the threshold values as follows: χ^2 (15) = 5839.14, $p < .001$, KMO = .94. Among six different

social roles that participants were asked to choose, 35.5% of them (n = 124) indicated a romantic partner to someone as one of the most salient social roles in their lives, followed by a friend to someone (n = 68, 19.5%), a parent (n = 49, 14.0%), a working person (n = 39, 11.2%), a son or daughter (n = 36, 10.3%), a college student (n = 23, 6.6%), and another role (n = 10, 2.9%). As for the 6-item scale to examine the structural validity of the social roles toward phubbing behavior, an EFA was performed. SR_1 (i.e., "I consider it appropriate to use my phone when I am with others) was a cross-loading factor, so it was eliminated from the scale. According to a result of the second-round EFA, the scale had a unidimensional structure with five valid items, accounting for 85.56% of the total variance (eigenvalue = 4.28).

Self-concept Relevant to Phubbing

The significance of Bartlett's test of sphericity was χ^2 (10) = 1230.11, p < .001, and the size of the KMO measure of sampling adequacy, KMO = .85, demonstrated that the dataset was sufficient to conduct EFA. The internal structure of the 5-item self-concept scale was investigated using EFA. The results of this initial EFA showed that SC_3 (i.e., "I feel I would become more of who I am if I used my phone when I am with others") was cross-loaded, and thus, it was removed. EFA was repeated and revealed the single-factor solution with the four valid items, explaining 76.78% of the total variance (eigenvalue = 3.07).

Affect toward Phubbing

Bartlett's test of sphericity value was significant as χ^2 (45) = 2328.81, p < .001, and the KMO value was calculated as .90. The initial EFA with the ten items assessing affect toward phubbing behavior loaded onto two factors. Two items (i.e., EMO_5 and EMO_9, "I feel comfortable using my phone when I am with others" and "It is foolish to use my phone when I am with others") were eliminated from the scale due to cross-loadings. A subsequent EFA with a pool of eight items was performed, which resulted in two factors. Factor 1

consisted of negative emotions, while positive emotions were loaded into factor 2. They explained 37.33% (factor 1; eigenvalue = 2.99) and 35.34% (factor 2; eigenvalue = 2.83), respectively.

Phubbing Habits

Both Bartlett's test of sphericity and KMO supported EFA as follows: χ^2 (66) = 3510.08, $p < .001$, and KMO = .96. An initial EFA with the 12 items assessing habitual phubbing behavior was performed. The results of the first EFA revealed that three items (i.e., HAB_2, HAB_4, and HAB_11; "It is normal for me to use my phone without explicitly planning to do so when I spend time with others," "I frequently find that I cannot focus on what others are saying because I am on my phone," and "Using my phone in the presence of others is a part of my life") were excluded from the preliminary item pool for being factored lower. After removing these items, EFA was continued, and it showed that the remaining nine items were determined to be grouped under a significant single factor in this scale. The eigenvalue was 6.31, with the factor explaining 70.06% of the total variance. All nine items of this scale also had acceptable load values in the factor (i.e., the remaining nine items were greater than .70), and there were no cross-loadings.

Facilitating Conditions of Phubbing

The data was appropriate as Bartlett's test of sphericity was significant as χ^2 (66) = 2980.53, $p < .001$, and the KMO measure of sampling adequacy was above the accepted .80 value (KMO = .95). An initial EFA with the 12 items measuring facilitating conditions of phubbing behavior was conducted. As a result of the first EFA showed four items (i.e., FC_2, FC_9, FC_11, and FC_12; "When a conversation is not interesting anymore," "When I am with my family," "If an argument or disagreement with my conversational partner develops," and "When a conversation does not require my full attention") were determined to overlap

with other factors. The eight items retained on this scale showed a unidimensional factor, which accounted for 62.59% of the total, with an eigenvalue of 5.01.

Phubbing Intentions

The results of Bartlett's test and KMO test showed that the data were adequate for EFA as χ^2 (21) = 955.01, $p < .001$, and KMO = .84. An initial EFA was performed on a 7-item phubbing intention scale. Of the seven initial total items, two items (i.e., PI_1 and PI_5; "Whenever possible, I intend to use my phone when I am with others" and "Assuming I get a notification, I would check my phone even during a conversation with others") were removed from the scale as a result of cross-loadings. The second round of EFA was conducted on the remaining five items and showed that the items were loaded onto a single factor. They explained 60.44% of the cumulative variance with an eigenvalue of 2.67.

To summarize, as indicated above, all factor loadings within a measure were strongly related to its factor. Therefore, the results of Study 1 suggested that all the measurement scales were sufficient to conduct further analyses. Table 12 provides detailed information about the scales with valid items, factor loadings, and item statistics for Study 1.

Table 12

Descriptive Statistics and Explanatory Factor Analysis Results of Study 1

Factor	Sub-factor	Code	Re-coded for CFA	Item	Loading	Mean (*SD*)
Phubbing Behavior		PHUB_3	PHUB_1	When I spend time with someone, I worry about missing important calls or messages.	.63	2.53 (.77)
		PHUB_5	PHUB_2	I believe I can carry on two conversations at once, one on my phone and the other one in person with someone.	.62	
		PHUB_6	PHUB_3	I sometimes find myself mindlessly scrolling through my phone, even when I am with other people.	.73	
		PHUB_8	PHUB_4	I sometimes respond to my conversation partner with very few words (e.g., "yeah," "uh-huh," and "right") because I am using my phone.	.68	
		PHUB_9	PHUB_5	Other people often tell me to put my phone away when I am with them.	.59	
		PHUB_10	PHUB_6	Every time notifications show up on my phone, I check them even if I am having a conversation with someone.	.67	
		PHUB_12	PHUB_7	I feel relieved when I stay connected with someone through social media or texting.	.55	
		PHUB_15	PHUB_8	I am always busy doing something on my phone.	.71	
		BELIEF_2	BELIEF_1	Keeping up with the latest information.	.71	2.65

Outcome Beliefs	Positive beliefs	BELIEF_3	BELIEF_2	Having a more interesting social life.	.83	(.92)
		BELIEF_5	BELIEF_4	Increasing the quality of my interpersonal relationships.	.70	
		BELIEF_6	BELIEF_5	Increasing my social productivity.	.77	
		BELIEF_11	BELIEF_9	Extending my social network.	.82	
	Negative beliefs	BELIEF_4	BELIEF_3R	Reducing my social skills.	.68	2.34
		BELIEF_8	BELIEF_6R	Hurting my conversational partner's feelings.	.88	(1.01)
		BELIEF_9	BELIEF_7R	Making my conversational partner feel awkward.	.90	
		BELIEF_10	BELIEF_8R	Making my conversational partner feel excluded.	.91	
		BELIEF_12	BELIEF_10R	Decreasing the quality of conversations with my conversation partner.	.82	
Outcome Evaluations	Positive evaluations	EVAL_2	EVAL_1	Keeping up with the latest information is _____.	.77	3.47
		EVAL_3	EVAL_2	Having a more interesting social life is_____.	.85	(.75)
		EVAL_5	EVAL_4	Increasing the quality of my interpersonal relationships is _____.	.73	
		EVAL_6	EVAL_5	Increasing my social productivity is _____.	.85	
		EVAL_11	EVAL_9	Extending my social networks is _____.	.81	
	Negative evaluations	EVAL_4	EVAL_3R	Reducing my social skills is_____.	.47	4.54
		EVAL_8	EVAL_6R	Hurting my conversational partner’s feelings is _____.	.86	(.58)
		EVAL_9	EVAL_7R	Making my conversational partner feel awkward is _____.	.90	
		EVAL_10	EVAL_8R	Making my conversational partner feel excluded is_____.	.92	

	EVAL_12	EVAL_10R	Decreasing the quality of conversations with my conversation partner is_____.	.82	
Social Norms	SN_1	SN_1	Most people around me would think it is appropriate to pull out my/their phone(s) and check it while engaged in a conversation.	.83	3.42 (.90)
	SN_2	SN_2	Most people around me would consider it appropriate to send text messages or emails to others while engaged in a conversation.	.78	
	SN_3	SN_3	Most people around me would consider it appropriate to pull my/their phone(s) when it rings or beeps, even if they are in the middle of a conversation.	.72	
	SN_4	SN_4	Using one's phone in a social setting (i.e., face-to-face conversation) is prevalent in my social circles.	.85	
	SN_5	SN_5	Using one's phone in a social setting (i.e., face-to-face conversation) is common in my social circles.	.86	
	SN_9	SN_6	Using one's phone in a social setting (i.e., face-to-face conversation) is typical in my social circles.	.84	
Social Roles	SR_2	SR_1	I find it fitting to use my phone when I am with others.	.78	3.42 (.90)
	SR_3	SR_2	I believe it is proper to use my phone when I am with others.	.88	
	SR_4	SR_3	I consider it appropriate to use my phone when I am with my friend or partner.	.98	

		SR_5	SR_4	I find it fitting to use my phone when I am with my friend or partner.	.98	
		SR_6	SR_5	I believe it is proper to use my phone when I am with my friend or partner.	.98	
Self-Concepts		SC_1	SC_1	I am the kind of person who would use their phone when others talk to me.	.92	2.45 (1.08)
		SC_2	SC_2	I am the kind of person who would use their phone during a typical mealtime with my friends or family.	.85	
		SC_4	SC_3	It is easy to imagine myself as a person who uses their phone in the middle of a conversation with others.	.90	
		SC_5	SC_4	Using my phone when I spend time with others is part of my personality.	.84	
Affect	Positive emotions	EMO_1	EMO_1	I find it exciting to use my phone when I am with others.	.77	2.31 (.88)
		EMO_3	EMO_3	Using my phone when I am with others relieves my stress.	.74	
		EMO_6	EMO_5	I find it pleasing to use my phone when I am with others.	.83	
		EMO_8	EMO_7	It is enjoyable to use my phone when I am with others.	.87	
	Negative emotions	EMO_2	EMO_2R	Using my phone when I am with others is disrespectful.	.85	2.50 (.99)
		EMO_4	EMO_4R	It is selfish to use my phone when I am with others.	.82	
		EMO_7	EMO_6R	I feel guilty using my phone in the middle of a conversation.	.83	
		EMO_10	EMO_8R	It is foolish to use my phone when I am with others.	.81	
		HAB_1	HAB_1	I always use my phone when I spend time with others.	.82	2.77

Phubbing	HAB_3	HAB_2	I use my phone almost every day when I am with others.	.87	(1.07)
Habits	HAB_5	HAB_3	I frequently find myself checking my phone for messages and social media updates when I am with others.	.88	
	HAB_6	HAB_4	I often find myself using my phone when I am with my friends just because it is lying there.	.86	
	HAB_7	HAB_5	It is natural for me to check my phone while spending time with others.	.89	
	HAB_8	HAB_6	When there is silence during a conversation with others, using my phone is an obvious choice for me.	.80	
	HAB_9	HAB_7	It is becoming a habit for me to use my phone while I am out with others.	.89	
	HAB_10	HAB_8	I automatically check my phone when I get pop-up notifications, even in the presence of others.	.78	
	HAB_12	HAB_9	I find myself paying attention to my phone for longer than I intend to while spending time with others.	.73	
Facilitating	FC_1	FC_1	When I get bored.	.82	3.20
Conditions	FC_3	FC_2	When the conversation is at a lull.	85	(1.23)
	FC_4	FC_3	When I just need a break from the conversation.	.83	
	FC_5	FC_4	When my phone rings or beeps.	.62	
	FC_6	FC_5	When I zone out.	.79	
	FC_7	FC_6	When my conversation partner uses his/her phone.	.81	

	FC_8	FC_7	When I am in a group of people (e.g., more than three people including me).	.78	
	FC_10	FC_8	When I spend time with my friends.	.81	
Phubbing Intentions	PI_2	PI_1	To the extent possible, I would check my phone in the middle of a conversation with others.	.78	2.84 (.85)
	PI_3	PI_2	I plan to increase my phone use when I am with others in the future.	.59	
	PI_4	PI_3	When there is a lull in the conversation, I am likely to use my phone.	.84	
	PI_6	PI_4	When I become bored, I am likely to use my phone to find something fun.	.67	
	PI_7	PI_5	I am likely to check my phone to withdraw from the situation if I am unwilling to engage in a conversation with others.	.75	

Note. Each construct's mean and standard deviation (*SD*) were calculated with the retained items.

Chapter 4. Study 2a - Methods and Results

Study 2a aimed to confirm and validate the factor structures identified through EFAs in Study 1. This purpose was achieved using confirmatory factor analysis (CFA). This chapter describes the data collection procedures, demographic profile of participants, and analyses and results of the reliability and validity tests of the scales. This study collected a new dataset for CFA. Participants who completed Study 1 (EFA) were not able to participate in Study 2 (CFA).

Participants

Given that this dissertation conducted CFA for all the developed scales and SEM to examine the hypotheses, a power analysis with medium effects (Cohen, 1988) was conducted using Soper's (2023) tool named a-priori sample size calculator for structural equation models. The analysis was conducted by entering the following necessary parameter values: effect size = .30, desired statistical power level = .80, number of latent variables = 10, number of observed variables = 74, and probability level = .05. The suggested sample size from the power analysis was 509 participants.

In this dissertation, a larger sample of 812 participants, exceeding the suggested sample size from the power analysis, were recruited to enhance the robustness and reliability of the study findings and reduce potential issues related to sampling variability. Of them, it was found that one participant's response contained extensive missing values. Due to the nature of missing data that can potentially distort the results, one response was excluded from the data, and thus, the final sample became 811. The participants of this study were adults residing in the United States: 428 males, 365 females, 17 others (e.g., transgender and non-binary), and one who preferred not to answer. Their age ranged from 18 to 85 years old (M_{age} = 43.77, *SD* = 15.46). Their detailed demographic characteristics are summarized in Table 13.

All participants for Study 2a were recruited from Prolific, and the same eligibility was applied: (a) people who were 18 or older, (b) a resident of the United States, and (c) have smartphones.

Table 13
Sample Characteristics of Study 2a (N = 811)

Demographics		Frequency (*n*)	Percentage (%)
Gender	Male	428	52.8%
	Female	365	45.0%
	Transgender	6	0.7%
	Other	11	1.4%
	Prefer not to answer	1	0.1%
Age	18-24 years old	76	9.4%
	25-34 years old	204	25.2%
	35-44 years old	164	20.2%
	45-54 years old	132	16.3%
	Over 55	235	29.0%
Ethnicity/Race	White/Caucasian	635	78.3%
	Hispanic/Latino/Latina	43	5.3%
	Black/African American	46	5.7%
	Asian	57	7.0%
	Native American/American Indian	3	0.4%
	Native Hawaiian/Pacific Islander	2	0.2%
	A combination of some of the above	21	2.6%
	Another ethnicity/race	1	0.1%
	Prefer not to answer	3	0.4%
Education level	High school degree or less	116	14.3%
	Some college	183	22.6%
	2-year college degree	76	9.4%
	4-year college degree	296	36.5%
	Professional degree	19	2.3%
	Graduate degree (e.g., M.A., Ph.D.)	116	14.3%
	Others	5	0.6%
	Prefer not to answer	0	0.0%
Occupation	Student	40	4.9%
	Unemployed	81	10.0%
	Not in paid work (e.g., homemaker, retired, or disabled)	118	14.5%

	Self-employed	95	11.7%
	Part-time	90	11.1%
	Full-time	368	45.4%
	Other	16	2.0%
	Prefer not to answer	3	0.4%
Annual Household income (USD)	0 - $24,999	220	27.1%
	$25,000 - $49,999	181	22.3%
	$50,000 - $74,999	175	21.6%
	$75,000 - $99,999	102	12.6%
	$100,000 - $149,999	82	10.1%
	$150,000 or more	38	4.7%
	Prefer not to answer	13	1.6%
Are you a smartphone user?	Yes	811	100%
	No	0	0.0%

Procedures

Study 2a followed the same procedures as Study 1. Briefly, eligible participants interested in this study were informed about the study (e.g., the purpose and benefits/risks of participation) and asked to consent to participate. If participants agreed to participate in the study, they were able to proceed to fill out the following three sections: (a) their smartphone usage patterns, (b) revised research instruments, and (c) demographic information. It took approximately 13 minutes to complete Study 2a's questionnaire. They received $2.00 (USD) for survey completion. Data were collected on March 25, 2023. The Institutional Review Board (IRB) at the author's university approved this research.

Measures

The items identified in EFA in Study 1 were renumbered (as indicated in "Re-coded for CFA" in Table 2 above) and used for the CFA in Study 2a. As in Study 1, participants in Study 2a responded on a 5-point Likert-type scale ranging from 1 = *strongly disagree* to 5 = *strongly agree.*

Step 7: Tests of Dimensions

In the seventh step, each scale's dimensionality and factor structure were assessed using CFA. As Hu and Bentler (1999) and Kline (2011) suggest, this study employed a maximum likelihood (ML) estimation method, using the SmartPLS 4 data analysis software with the covariance-based SEM (CB-SEM) model estimation. Each model was assessed based on the following global fit indices as recommended by Bentler (1990) and Hair et al. (2010): comparative fit index (CFI) ≥ .90, root mean squared error of approximation (RMSEA) ≤ .08, and standardized root mean squared residual (SRMR) ≤ .08. These global fit indices served as the primary indicators examined to assess the adequacy of model fit.

Brown (2015) suggests processes for refining CFA models when initial CFA results fail to reach the criteria of global model fit indices. This study also adheres to his guidelines. In line with his approach, when any indices did not meet the criteria, the first step was identifying strains within the model because they imply discrepancies or inconsistencies observed in the relationships among latent variables and their corresponding observed indicators within the structural equation model. The factor loadings reflecting the relationship between each latent factor and its indicator variables were initially inspected to find the strains that can lower the overall fit. For the CFA of this study, a factor loading value threshold of .70 (including values rounded to .70) was considered acceptable, as Brown (2015) and Hair et al. (2017) recommended. Items that did not meet this cut-off (value < .70) were removed from the data because poor factor loadings potentially contribute to diminishing model fit and validity of a scale.

In addition, an examination of standardized residuals for each item was conducted. Large residuals indicate significant differences between the variance-covariance matrices predicted by the model and the observed values in the sample. According to Brown (2015), large residuals are absolute values exceeding 2.58 (Brown, 2015). Also, as Brown (2015) suggested, this study explored modification indices (MI) to find possible misspecifications

and improvements to the CFA model. Specifically, this study considered adding theoretically justifiable covariances between error terms of similar-worded or theoretically relevant items (i.e., items expected to measure the similar underlying construct or conceptually related items within the measurement model). This process was repeated until the given measurement instrument achieved an acceptable model fit, satisfying the prescribed criteria of the abovementioned indices.

Results – Confirmatory Factor Analysis (CFA)

In Study 2a, each scale's dimensions and factor structures were confirmed and verified through CFA instead of conducting CFA for a whole TIB framework in the context of phubbing for the measurement model. This approach was adopted because this dissertation aimed to consider the scales' distinct conceptual structures and intended constructs. Also, conducting individual CFAs enables a detailed examination of factor loadings, item relationships, and model fit specific to each scale, thus ensuring the validity and reliability of each. The following are the CFA results of each instrument.

Phubbing Behavior

An initial CFA conducted with the *phubbing behavior* scale comprised of eight items resulted in a model that did not fit all the predetermined criteria mentioned above. Specifically, the initial CFA showed the following fit indices: $\chi^2(20) = 141.09$, $p < .001$, CFI = .96, RMSEA = .09, and SRMR = .04. All indices, except for the RMSEA, met the cut-off. The RMSEA value of .09 suggested refining the model. Therefore, factor loadings were first inspected to diagnose possible localized areas of strain. It was observed that an item (i.e., PHUB_7 – "I feel relieved when I stay connected with someone through social media or texting") showed a low factor loading with a value of .57. Therefore, this item was dropped, and the CFA was re-run, without it.

The fit of the revised model improved. However, the value of RMSEA was slightly above the criteria with a value of .081: $\chi^2(14) = 88.14$, $p < .001$, CFI = .97, RMSEA = .08, and SRMR = .04. Similar to the previous stage, the factor loadings were examined again. PHUB_1 ("When I spend time with someone, I worry about missing important calls or messages") had a factor loading of .61. This item was removed from the test, and CFA was performed again. According to this third CFA test, the adjusted model fit was acceptable: $\chi^2(9) = 46.06$, $p < .001$, CFI = .98, RMSEA = .07, and SRMR = .03. Consequently, the phubbing scale included six items.

Outcome Beliefs toward Phubbing

Outcome beliefs toward phubbing scale were examined as a two-factor model: positive beliefs (five items) and negative beliefs (five items). This model had an acceptable fit: $\chi^2(34) = 149.83$, $p < .001$, CFI = .98, RMSEA = .07, and SRMR = .04.

Outcome Evaluations toward Phubbing

Outcome evaluations toward phubbing were investigated as a two-factor model, with positive evaluations (five items) and negative evaluations (five items). This model displayed a marginally poor model fit because the value of RMSEA was .081: $\chi^2(34) = 214.12$, $p < .001$, CFI = .97, RMSEA = .08, and SRMR = .07. One item (i.e., EVAL_1 – "Keeping up with the latest information is _____") had a lower factor loading value of .65. After removing the item, the CFA results showed an acceptable model fit as the value of RMSEA decreased to .076 (value rounded to .08): $\chi^2(26) = 159.88$, $p < .001$, CFI = .98, RMSEA = .08, and SRMR = .07. Consequently, the scale of outcome evaluations toward phubbing consisted of nine items, including four positive evaluations and five negative evaluations.

Social Norms Regarding Phubbing

The scale of social norms regarding phubbing included six items. The initial CFA results showed that this single-factor model had a poor fit: $\chi^2(9) = 831.88$, $p < .001$, CFI

= .80, RMSEA = .34, and SRMR = .18, suggesting a modification of the model was needed. According to factor loadings, it was found that an item (SN_5 – "Using one's phone in a social setting (i.e., face-to-face conversation) is prevalent in my social circles") had a lower factor loading at .49. After dropping the item, CFA was conducted again. However, the modified model still had a poor fit: $\chi^2(5) = 560.81$, $p < .001$, CFI = .85, RMSEA = .33, and SRMR = .16. Then, according to the results of modification indices, this study added a covariance between SN_1 ("Most people around me would think it is appropriate to pull out my/their phone(s) and check it while engaged in a conversation") and SN_2 ("Most people around me would consider it appropriate to send text messages or emails to others while engaged in a conversation") as the wording and structure of them were similar. The results of CFA indicated that this modified model fit was excellent: $\chi^2(4) = 7.89$, $p = .10$, CFI = 1.00, RMSEA = .04, and SRMR = .01.

Social Roles Relevant to Phubbing

The initial CFA with the five items measuring social roles relevant to phubbing did not have an acceptable model fit: $\chi^2(5) = 269.42$, $p < .001$, CFI = .95, RMSEA = .26, and SRMR = .04. As the value of RMSEA did not meet its criterion, inspection of the model was implemented with the values of factor loadings. One item (i.e., SR_1 – "I find it fitting to use my phone when I am with others") had lower factor loading at a value of .50. It was decided to drop the item from the data. After the removal, CFA was conducted again. The goodness of fit test was improved, and the model with four items finally showed an acceptable fit: $\chi^2(2) = 7.10$, $p = .03$, CFI = 1.00, RMSEA = .06, and SRMR = .01.

Self-concept Relevant to Phubbing

All the four items measuring the self-concept relevant to phubbing were retained by yielding an acceptable model fit: $\chi^2(2) = 6.55$, $p = .04$, CFI = 1.00, RMSEA = .05, and SRMR = .01.

Affect toward Phubbing

According to the initial CFA, the eight items with the two-factor (i.e., positive emotions and negative emotions) measuring affect toward phubbing had an acceptable model fit: $\chi^2(19) = 49.67$, $p < .001$, CFI = .99, RMSEA = .05, and SRMR = .03.

Phubbing Habits

The initial model fit of the habitual phubbing scale with nine items was not acceptable: $\chi^2(27) = 191.89$, $p < .001$, CFI = .98, RMSEA = .09, and SRMR = .02. To be specific, the value of RMSEA did not satisfy the criterion. The model was investigated first by examining factor loadings and residual covariances to improve the fit. The factor loadings of all nine items were over .70, and there were no significant high residual covariances between the items. Then, this study investigated modification indices. It was decided to add one covariance between HAB_1 ("I always use my phone when I spend time with others") and HAB_2 ("I use my phone almost every day when I am with others") because for the participants, the terms "always" and "almost every day" may sound similar. As a result, it improved model fit to be acceptable: $\chi^2(26) = 117.60$, $p < .001$, CFI = .99, RMSEA = .07, and SRMR = .02.

Facilitating Conditions of Phubbing

Results from the initial CFA with eight items measuring the facilitating condition of phubbing showed that the model fit was not acceptable due to the value of RMSEA: $\chi^2(20) = 181.17$, $p < .001$, CFI = .97, RMSEA = .10, and SRMR = .03. For the better model fit, an investigation of localized strains was implemented. One item (i.e., FC_4 "When my phone rings or beeps") had a factor loading value of .66, which was below the criterion. It was removed from the test, and CFA was performed again. The results of the second round revealed that the model fit was not significantly improved: $\chi^2(14) = 148.53$, $p < .001$, CFI = .97, RMSEA = .10, and SRMR = .03. When exploring the factor loadings to find possible

problematic indicators, the remaining seven items were above .70. No indicators had large absolute residual covariances. Then, modification indices were investigated and found that the highest MI was between FC_7 ("When I am in a group of people (e.g., more than three people including me") and FC_8 ("When I spend time with my friends"), because despite indicating different facilitating contexts, both items might be perceived as similar due to their shared emphasis on interpersonal interaction and social dynamics within a group setting. The fit was improved after a covariance was added between them: $\chi^2(13) = 70.71$, $p < .001$, CFI = .99, RMSEA = .07, and SRMR = .02.

Phubbing Intentions

With the five items measuring phubbing intentions, the first CFA yielded a poor model fit in that the value of RMSEA did not meet the acceptable thresholds: $\chi^2(5) = 152.460$, $p < .001$, CFI = .90, RMSEA = .19, and SRMR = .08. On inspection the initial model, one item (i.e., PI_2 – "I plan to increase my phone use when I am with others in the future") had a low value of factor loading at .50. After removing the item, CFA was performed again. However, the value of RMSEA still did not fall into the acceptable threshold: $\chi^2(5) = 41.41$, $p < .001$, CFI = .97, RMSEA = .16, and SRMR = .05. When examined the factor loadings of the remaining items, they were over .70. Thus, standardized residual covariances were examined. However, all the values satisfied the threshold (i.e., less than an absolute value of 2.58). Then, modification indices reviewed. The results revealed a significant MI value of 14.90 between the similar items, namely PI_1 ("To the extent possible, I would check my phone in the middle of a conversation with others") and PI _3 ("I plan to increase my phone use when I am with others in the future"). Because of their similar wordings, covariance was added between these two items, and CFA was re-run. Consequently, this modified model had an excellent fit: $\chi^2(1) = .02$, $p = .91$ .05, CFI = 1.00, RMSEA = .00, and SRMR = .00.

Steps 8 and 9: Tests of Reliability and Validity

In the eighth and ninth steps, the reliability and validity of a given scale are tested through construct reliability and convergent validity (Boateng et al., 2018). In this study, based on suggestions by Fornell and Lacker (1981) and Hair et al. (2010), the following measures and their cut-off values were used to examine whether each scale was valid and reliable. For the construct reliability, Cronbach's alpha (α) and composite reliability (CR) were employed to evaluate the internal consistency of the items within each construct to ensure that the items in a given scale measure the same concept constantly at an acceptable value of .70 or higher for both measures. For the convergent validity, the average variance extracted (AVE) representing the average amount of variance explained by the items relative to the measurement error was calculated, with a threshold of .50 or above being considered acceptable.

Results – Reliability and Validity of Scales

After conducting CFA, this study evaluated the reliability and validity of each measurement instrument based on the cut-off mentioned above. According to the results, all ten constructs developed in this study achieved all the desired cut-off values. Thus, it was concluded that each scale was valid and reliable. The results and each indicator's factor loading value are indicated in Table 14.

Table 14

Confirmatory Factor Analysis Results of Study 2a

Factor	Sub-factor	Code	Item	Loading	AVE	CR	α
Phubbing		PHUB_2	I believe I can carry on two conversations at once, one on my phone and the other one in person with someone.	.60	.52	.86	.87
		PHUB_3	I sometimes find myself mindlessly scrolling through my phone, even when I am with other people	.79			
		PHUB_4	I sometimes respond to my conversation partner with very few words (e.g., “yeah," "uh-huh," and "right") because I am using my phone.	.78			
		PHUB_5	Other people often tell me to put my phone away when I am with them.	.72			
		PHUB_6	Every time notifications show up on my phone, I check them even if I am having a conversation with someone.	.66			
		PHUB_8	I am always busy doing something on my phone.	.76			
Outcome Beliefs	Positive beliefs	BELIEF_1	Keeping up with the latest information	.57	.58	.87	.87
		BELIEF_2	Having a more interesting social life.	.83			
		BELIEF_4	Increasing the quality of my interpersonal relationships.	.78			
		BELIEF_5	Increasing my social productivity.	.90			
		BELIEF_9	Extending my social network.	.70			
		BELIEF_3R	Reducing my social skills	.55	.69	.91	.91

	Negative beliefs	BELIEF_6R	Hurting my conversational partner's feelings	.90			
		BELIEF_7R	Making my conversational partner feel awkward	.91			
		BELIEF_8R	Making my conversational partner feel excluded	.92			
		BELIEF_10R	Decreasing the quality of conversations with my conversation partner	.81			
Outcome Evaluations	Positive evaluations	EVAL_2	Having a more interesting social life is ____.	.72	.63	.87	.87
		EVAL_4	Increasing the quality of my interpersonal relationships is ____.	.92			
		EVAL_5	Increasing my social productivity is ____.	.70			
		EVAL_9	Extending my social network is ____.	.79			
	Negative evaluations	EVAL_3R	Reducing my social skills is ____.	.64	.73	.93	.93
		EVAL_6R	Hurting my conversational partner's feelings is ____.	.92			
		EVAL_7R	Making my conversational partner feel awkward is ____.	.93			
		EVAL_8R	Making my conversational partner feel excluded is ____.	.95			
		EVAL_10R	Decreasing the quality of conversations with my conversation partner is ____.	.79			
Social Norms		SN_1	Most people around me would think it is appropriate to pull out my/their phone(s) and check it while engaged in a conversation.	.52	.64	.89	.90

	SN_2	Most people around me would consider it appropriate to send text messages or emails to others while engaged in a conversation.	.54			
	SN_4	Using one's phone in a social setting (i.e., face-to-face conversation) is prevalent in my social circles.	.89			
	SN_5	Using one's phone in a social setting (i.e., face-to-face conversation) is common in my social circles.	.96			
	SN_6	Using one's phone in a social setting (i.e., face-to-face conversation) is typical in my social circles.	.95			
Social Roles	SR_2	I believe it is proper to use my phone when I am with others.	.84	.83	.95	.95
	SN_3	I consider it appropriate to use my phone when I am with my friend or partner.	.91			
	SN_4	I find it fitting to use my phone when I am with my friend or partner.	.96			
	SN_5	I believe it is proper to use my phone when I am with my friend or partner.	.95			
Self-Concepts	SC_1	I believe it is proper to use my phone when I am with others.	.90	.70	.90	.90
	SC_2	I consider it appropriate to use my phone when I am with my friend or partner.	.76			
	SC_3	I find it fitting to use my phone when I am with my friend or partner.	.87			

		SC_4	I believe it is proper to use my phone when I am with my friend or partner.	.82			
Affect	Positive emotions	EMO_1	I find it exciting to use my phone when I am with others.	.78	.67	.89	.89
		EMO_3	Using my phone when I am with others relieves my stress.	.72			
		EMO_5	I find it pleasing to use my phone when I am with others.	.90			
		EMO_7	It is enjoyable to use my phone when I am with others.	.85			
	Negative emotions	EMO_2R	Using my phone when I am with others is disrespectful.	.85	.58	.84	.84
		EMO_4R	It is selfish to use my phone when I am with others.	.82			
		EMO_6R	I feel guilty using my phone in the middle of a conversation.	.63			
		EMO_8R	It is foolish to use my phone when I am with others.	.73			
Phubbing Habits		HAB_1	I always use my phone when I spend time with others.	.82	.73	.96	.96
		HAB_2	I use my phone almost every day when I am with others.	.85			
		HAB_3	I frequently find myself checking my phone for messages and social media updates when I am with others.	.88			
		HAB_4	I often find myself using my phone when I am with my friends just because it is lying there.	.89			
		HAB_5	It is natural for me to check my phone while spending time with others.	.88			
		HAB_6	When there is silence during a conversation with others, using my phone is an obvious choice for me.	.80			

	HAB_7	It is becoming a habit for me to use my phone while I am out with others.	.91			
	HAB_8	I automatically check my phone when I get pop-up notifications, even in the presence of others.	.76			
	HAB_9	I find myself paying attention to my phone for longer than I intend to while spending time with others.	.83			
Facilitating Conditions	FC_1	When I get bored	.89	.69	.94	.94
	FC_2	When the conversation is at a lull.	.90			
	FC_3	When I just need a break from the conversation.	.86			
	FC_5	When my phone rings or beeps.	.82			
	FC_6	When my conversation partner uses his/her phone.	.73			
	FC_7	When I am in a group of people (e.g., more than three people including me).	.80			
	FC_8	When I spend time with my friends.	.80			
Phubbing Intentions	PI_1	To the extent possible, I would check my phone in the middle of a conversation with others.	.59	.52	.81	.82
	PI_3	When there is a lull in the conversation, I am likely to use my phone.	.74			
	PI_4	When I become bored, I am likely to use my phone to find something fun.	.70			

PI_5	I am likely to check my phone to withdraw from the situation if I am unwilling to engage in a conversation with others.	.81

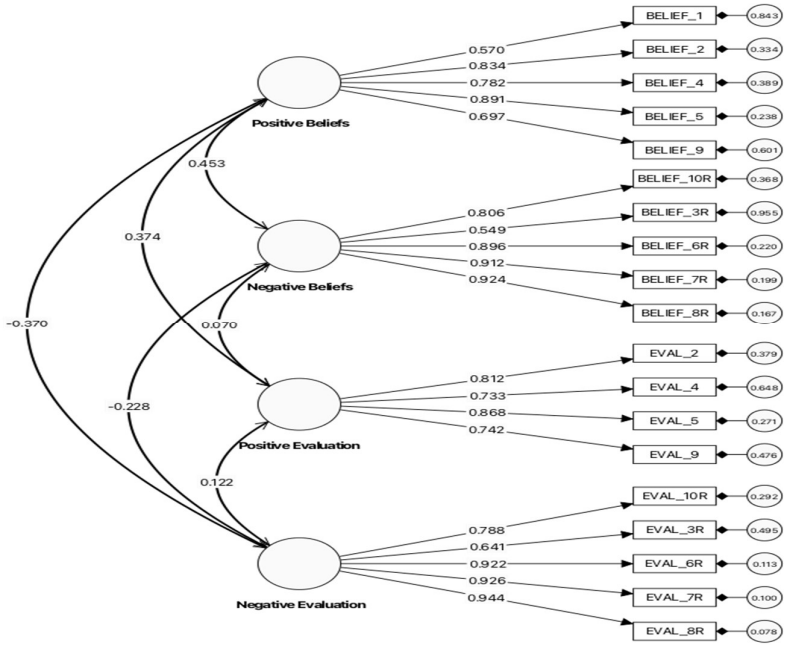
Results – CFA of Higher-Order Attitudes Model

According to the TIB (Triandis, 1977), outcome beliefs and outcome evaluations contribute to forming attitudes toward a given behavior. That is, attitudes are developed based on beliefs about the possible outcome and evaluations when individuals engage in a given behavior. Based on the CFA results for the outcome beliefs and outcome evaluations in Study 2a, a new CFA model with all four sub-factors (i.e., positive beliefs, negative beliefs, positive evaluations, and negative evaluations) was created and tested for attitudes toward phubbing (i.e., a new latent variable).

Specifically, a second-order CFA for the latent factor of attitude was conducted, with two sub-factor CFA models of outcome beliefs (i.e., ten items loaded to two sub-factors – positive beliefs and negative beliefs) and outcome evaluations (i.e., nine items loaded to two sub-factors – positive evaluations and negative evaluations). In the first stage, the model shown in Figure 3 below had an excellent fit: $\chi^2(146) = 665.44$, $p < .001$, CFI = .95, RMSEA = .07, and SRMR = .06.

Figure 3

New First-Order Attitude CFA Model Result



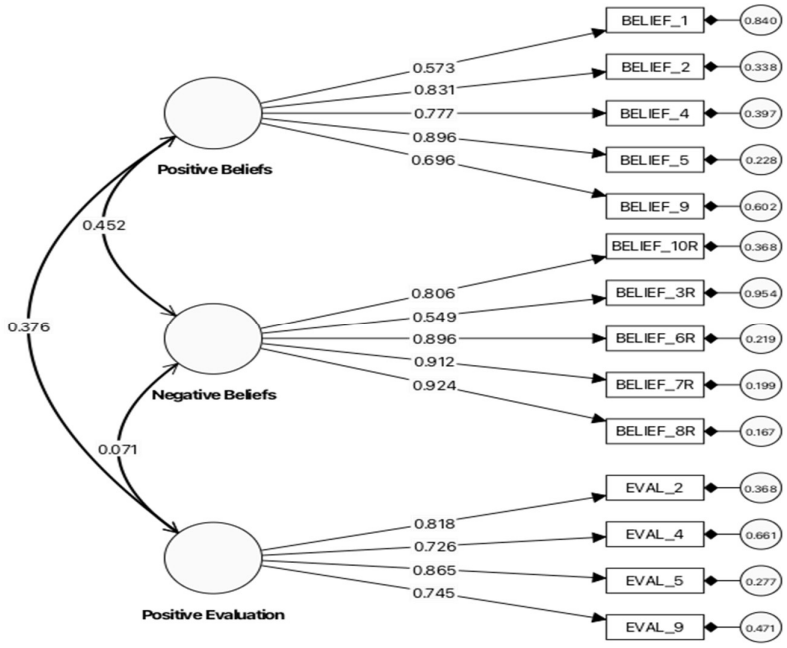
However, two negative correlations between the sub-factors were identified: between negative beliefs and negative evaluations (r = -.23, p < .001) and between positive beliefs and negative evaluations (r = -.37 p < .001). Despite the good model fit, these results suggested model misspecification because their correlation signs were theoretically unreasonable. The reasons are as follows.

First, the items loaded with negative beliefs (BELIEF_3R, BELIEF_6R, BELIEF_7R, BELIEF_8R, BELIEF_10R) and negative evaluations (EVAL_3R, BELIEF_6R, BELIEF_7R, BELIEF_8R, BELIEF_10R) were reverse coded before conducting the CFA in this study. Therefore, all four sub-factors of attitudes should be positively correlated. Second, the two sub-factors – positive and negative beliefs – in the outcome belief model examined earlier in the CFA were positively correlated. This positive correlation was confirmed in the second-order outcome evaluation model only between positive and negative evaluations. However, these correlations changed their sign when the four first-order variables were examined together in the same CFA.

Instead of developing a new second-order two-factor attitude model (in this case, outcome beliefs and outcome evaluations would be second-order factors), the model was inspected closely to find problematic factors or items. After multiple attempts to analyze the correlations between the four first-order variables, it was found that the negative evaluations factor was problematic. Indeed, as shown in Figure 4 below, after removing the factor, the first-order three-factor Attitude model had an excellent fit: $\chi^2(74) = 336.49$, p < .001, CFI = .96, RMSEA = .07, and SRMR = .06, and the three factors were positively correlated to each other.

Figure 4

First-Order Attitude CFA Model After Removing Negative Evaluations



Next, a second-order three-factor model of attitude was attempted by adding the two latent variables (i.e., outcome beliefs and outcome evaluations) to the first-order attitude model after removing negative evaluations. However, the second-order three-factor model could not be developed because outcome evaluations included only one first-order factor (i.e., Positive evaluations). Indeed, according to Kline (2011), multiple first-order factors are required for each second-order latent variable, especially in the context of CFA. Therefore, it was decided to revise the first-order attitude CFA model, depicted in Figure 4.

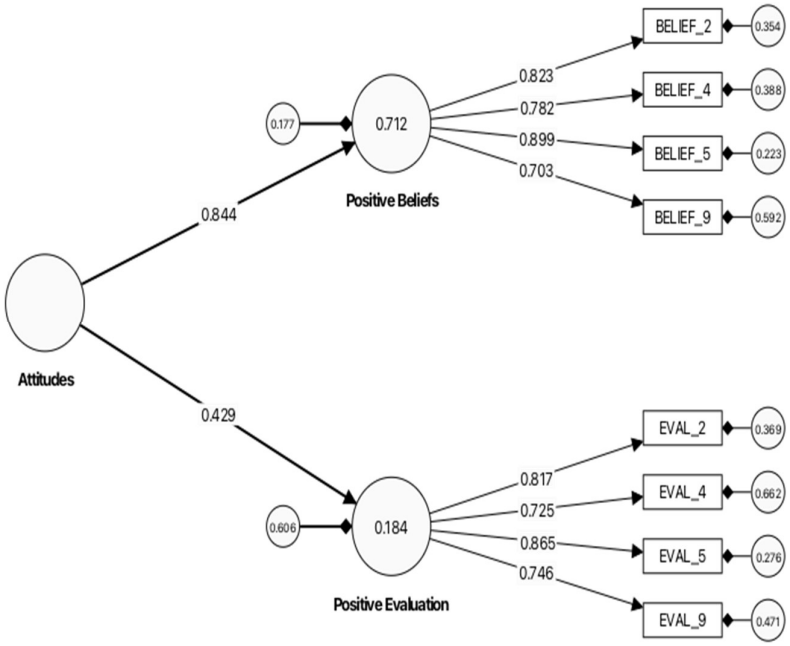
After considering alternatives, negative beliefs and negative evaluations were removed. These two negative factors were dropped from the attitude model because they consisted of reverse-coded items. The use of reversed items – that is, items that ought to be recoded and, thus, all the items of a scale have the same directional relationship with the target construct (Weijters et al., 2013) – in the development of scales has been a controversial issue (Vigil-Colet et al., 2020). Although they allow to control for the effects of acquiescence

(Paulhus & Vazire, 2005), measures with reversed items in typical response measures gives rise to several negative consequences. In particular, their inclusions decrease the scale's internal consistency due to lower inter-total correlations (Paulhus & Vazire, 2005) and cause poorer fits to the target model in factor analyses, such as EFA and CFA (Danner et al., 2015). Their inclusion often yields a two-dimensional structure, including positive and negative items, into separate factors when measuring unidimensional constructs (Paulhus & Vazire, 2005).

In this study, as indicated in the results of EFA and CFA in Chapter 4, especially regarding the outcome beliefs and evaluations toward phubbing behavior scales, reverse-coded items were loaded to separate factors and named negative outcome beliefs and negative outcome evaluations, respectively. Since these two scales were in line with the drawbacks of reversed items, they were removed from the model. Specifically, ten items that loaded to negative outcome beliefs (i.e., BELEFS_3R, BELEFS_6R, BELEFS_7R, BELEFS_8R, and BELEFS_10R) and negative outcome evaluations (i.e., EVAL_3R, EVAL_6R, EVAL_7R, EVAL_8R, EVAL_10R) were eliminated. After dropping these negative beliefs and evaluation factors, a new second-order model was attempted with only the positive beliefs and positive evaluations. The second-order two-factor attitude model (Figure 5) was acceptable: $\chi^2(18) = 127.94$, $p < .001$, CFI = .97, RMSEA = .08, and SRMR = .05. It was concluded to be valid and thus used in Study 2b.

Figure 5

Final Second-Order Two-Factor Model of Attitude



Chapter 5. Results – Study 2b

Based on the findings from the CFA in Study 2a, Study 2b assessed the conceptual framework of TIB, illustrated in Figure 2, alongside its relevant hypotheses to ensure its applicability in explaining phubbing behavior. These investigations were conducted using structural equation modeling (SEM). Methodologically, this study conducted descriptive analyses of the data set with a sample size of 811, along with correlation analyses to assess the strength and direction of the relationships between the study variables (i.e., second-order and first-order latent variables). All statistics were explored using the SmartPLS 4 employing the covariance-based SEM (CB-SEM) model estimation, which is conducive to the maximum likelihood (ML) approach.

Covariates

As age and gender were significantly related to phubbing behavior, this study added these variables as covariates in the hypothesized conceptual framework of TIB in the context of phubbing. In particular, because gender was categorical variable, it was coded as follows for SEM: 1 = male, 2 = female, 3 = transgender, 4 = others, and 5 prefer not to answer

Preliminary Analysis

Before conducting SEM, several preliminary analyses were performed. First, measures including mean, standard deviation (SD), skewness, kurtosis, and Pearson's correlation coefficients (r) were explored for the descriptive and correlation analyses. The results of these analyses are presented in Table 15 below.

Specifically, phubbing intentions were found to have significant and positive correlations with attitudes toward phubbing that were determined by outcome beliefs and outcome evaluations ($r = .47$, $p < .001$). The composite variable of social factors constructed from the mean social norms, social roles, and self-concepts was also positively and significantly correlated to phubbing intentions ($r = .70$, $p < .001$). In addition, it was found

that there were positive correlations between affect toward phubbing and phubbing intentions ($r = .66$, $p < .001$). Phubbing intentions were strongly and positively correlated with phubbing behavior ($r = .73$, $p < .001$). Finally, phubbing behavior was also strongly correlated with phubbing habits ($r = .80$, $p < .001$) and facilitating conditions. ($r = .75$, $p < .001$), respectively.

Table 15

Descriptive Statistics and Pearson's Correlations Results of Study 2b

		1	2	3	4	5	6	7
	Age	-.22***	-.25***	-.15***	-.21***	-.19***	-.35***	-.33***
1.	Phubbing	-						
2.	Attitudes	.47***	-					
3.	Social Factors	.70***	.51***	-				
4.	Affect	.66***	.49***	.72***	-			
5.	Phubbing Habits	.80***	.52***	.78***	.65***	-		
6.	Facilitating Conditions	.75***	.48***	.72***	.59***	.85***	-	
7.	Phubbing Intention	.73***	.48***	.67***	.57***	.78***	.78***	-
	M	2.39	2.79	2.55	2.15	2.52	2.63	2.81
	SD	0.91	0.73	0.80	0.74	1.05	0.95	0.97
	Skewness	0.41	-0.14	0.15	0.59	0.29	0.12	-0.11
	Kurtosis	-0.46	0.26	-0.51	-0.17	-0.88	-0.72	-0.72

Notes. ***$p < .001$.

Results are based on the final valid items tested through the CFA in Study 2a indicated in Table 14

Given some high correlations between the study variables, collinearity diagnostics were assessed by examining the variance inflation factor (VIF). A VIF value greater than five is considered a significant multicollinearity issue (Hair et al., 2017). The results showed that the tolerance level in the predictor constructs was below the critical threshold of VIF 5.0 as follows: attitudes = 1.56, social factors = 3.34, affect = 2.35, phubbing habits = 4.96, facilitating conditions = 4.36, and phubbing intentions = 3.31. Consequently, multicollinearity among phubbing predictors was not a severe problem in this study.

In addition, discriminant validity, which is a crucial method in SEM that measures whether latent factors in a model are different from each other, was tested using the Heterotrait-Monotrait (HTMT) ratio by Henseler et al. (2015). A threshold value of HTMT is .90 or below to be acceptable. As indicated in Table 16 below, all HTMT values of this study variables met the acceptable criterion. Therefore, it was concluded that the discriminant validity was achieved, implying that the constructs in the structural equation model would be reasonably distinct.

Table 16

The HTMT Correlation Matrix Results between Latent Variables

	PHUB	(P)BELIEF	(P)EVAL	SN	SR	SC	(P)EMO	(N)EMO	HABIT	FC	PI
PHUB											
(P)BELIEF	.67										
(P)EVAL	.27	.34									
SN	.48	.46	.15								
SR	.61	.60	.22	.46							
SC	.88	.67	.27	.54	.67						
(P)EMO	.86	.71	.28	.45	.65	.83					
(N)EMO	.53	.53	.20	.44	.65	.62	.69				
HABIT	.88	.65	.30	.54	.66	.89	.77	.53			
FC	.84	.60	.34	.53	.52	.83	.71	.52	.89		
PI	.81	.58	.38	.50	.51	.77	.69	.45	.84	.89	

Notes. PHUB = Phubbing Behavior, (P)BELIEF = Outcome (Positive) Beliefs, (P)EVAL = Outcome (Positive) Evaluations, SN = Social Norms, SR = Social Roles, SC = Self-Concepts, (P)EMO = Positive Emotion, N(EMO) = Negative Emotion, HABIT = Phubbing Habits, FC = Facilitating Conditions, PI = Phubbing Intentions

Assessment of Model and Hypotheses

Structural equation modeling (SEM) was conducted using the same CB-SEM of SmartPLS 4 with the same criteria suggested by Bentler (1990) and Hair et al. (2010) – that is, CFI ≥ .90., RMSEA ≤ .08, and SRMR ≤ .08 – and the modifications made in the CFA to examine the proposed conceptual framework and the hypotheses of this study. According to the results, the model, allowing covariances between the exogenous factors of this study and including age and gender as covariates, had an acceptable fit: $\chi^2(1436) = 4389.22$, $p < .001$, CFI = .92, RMSEA = .05, and SRMR = .05. Thus, it was concluded that the TIB is theoretically applicable to predict individuals' phubbing behavior. Figure 6 represents the structural model showing the standardized structural path coefficients (β or γ) and their corresponding significance (p-value).

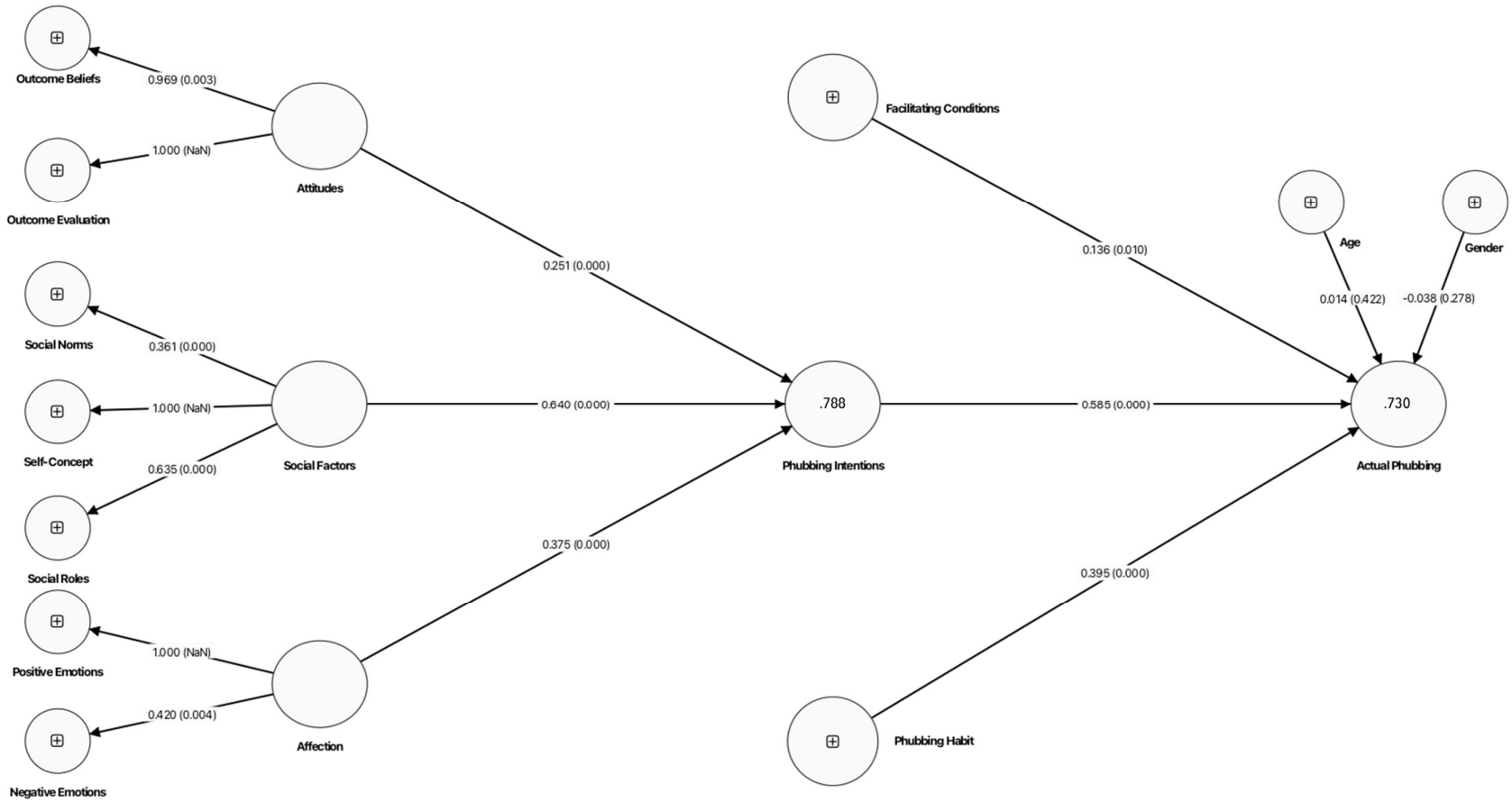
Next, the hypotheses of this study were examined. SEM results supported all the hypotheses. Specifically, H1 was supported. Individuals' attitudes toward phubbing behavior were positively associated with phubbing intentions ($\gamma = .25$, $p < .001$). In addition, social factors determined by the interplay of social norms, self-concepts, and social roles relevant to phubbing behavior had significant and positive associations with phubbing intentions ($\gamma = .64$, $p < .001$), supporting H2. Affect toward phubbing behavior also turned out to be a significant predictor of phubbing intentions ($\gamma = .38$, $p < .001$), substantiating H3. Individuals' intentions to phub others were positively associated with phubbing behavior ($\beta = .59$, $p < .001$), supporting H4. Additionally, phubbing habits were shown to be positively related to phubbing behavior ($\beta = .40$, $p < .001$). Facilitating conditions of phubbing behavior were positively and directly related to phubbing behavior ($\beta = .14$, $p < .05$), confirming H5 and H6, respectively.

The SEM results also revealed that the hypothesized framework had good explanatory powers. To be specific, the cumulative effects of the three predictors – attitudes toward

phubbing that are shaped by outcome beliefs and outcome evaluations, social factors regarding phubbing consisting of social norms, social roles, and self-concepts, and affect toward phubbing – explained 78.8% of the variance in phubbing intentions (R^2 = .79). Additionally, 73.0% of the variance in phubbing behavior was explained by phubbing intentions, phubbing habits, and facilitating conditions of phubbing (R^2 = .73).

Figure 6

Graphical Structural Equation Modeling Results



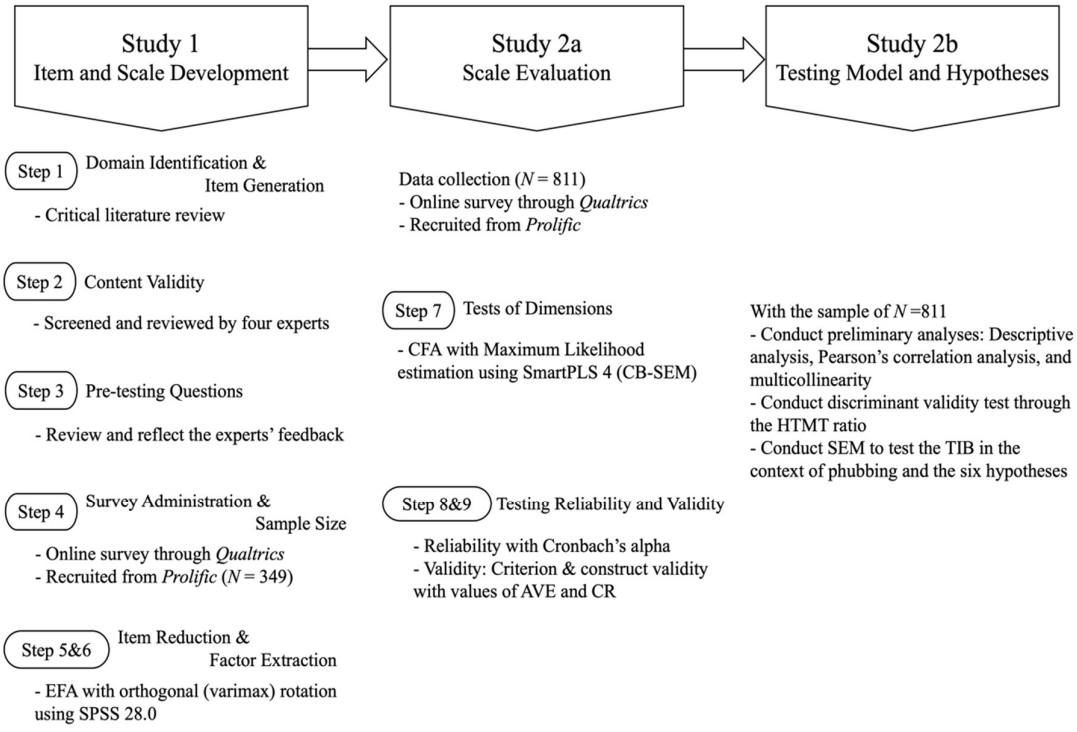
Notes. Numbers in circles represent R^2 values. All path coefficients are standardized.

Chapter 6. Discussion and Conclusion

This study aimed to achieve the following two purposes: (a) apply the theory of interpersonal behavior (TIB) by Triandis (1977) to explain individuals' phubbing behavior and test the hypotheses derived from the framework and (b) develop and validate scales from TIB as applied to the context of phubbing behavior. These objectives were accomplished through three parts of this dissertation conducted using online surveys. Specifically, in Study 1, multiple items of the scales from TIB in the context of phubbing were generated through thorough literature reviews. In addition, the generated pool of items was screened and reviewed by four subject-matter experts, consisting of communication professors. The items were analyzed through EFA to identify the factor structures of each developed scale. In Study 2a, the items and scales retained from Study 1 were analyzed and evaluated using CFA. Consequently, this study confirmed and validated the proposed measurement instruments explored in Study 1. Based on the results of Study 1 and Study 2a, Study 2b tested the dissertation's proposed hypotheses using SEM. The hypothesized conceptual model investigated the constructs of TIB in the context of phubbing, examining relationships between attitudes, social factors, affect, phubbing intentions, phubbing habits, facilitating conditions, and phubbing behavior. The overall procedures of this study are illustrated in Figure 7 below.

Figure 7

Overall Research Procedure



This chapter reviews and interprets the findings of this study. Then, theoretical, methodological, and practical implications, limitations, and suggestions for future research are discussed.

Discussion of Study 1

Study 1 generated items based on existing literature and experts' reviews. Initial pools of 102 items distributed across ten scales were created in this process. Specifically, a 16-item measure was created to measure one's phubbing behavior. In addition, separate pools of 12 items each were generated to measure outcome beliefs toward phubbing and outcome evaluations toward phubbing. Moreover, scales measuring social norms with ten items, social roles with six items, and self-concepts with five items relevant to phubbing were developed, respectively. The original scales measuring phubbing habits, facilitating conditions of

phubbing, and phubbing intentions were constructed with 12 items, 12 items, and seven items, respectively.

With the generated items, this study first conducted the KMO test and Bartlett's test of sphericity to examine whether the data collected for EFA were suitable. The KMO value of each scale was above .80. The results of Bartlett's test of sphericity also showed that each scale was at a significant level ($p < .05$). Thus, it was concluded that the data were great to perform EFAs. The factor structures of each scale were explored and identified using EFA utilizing PCA with varimax rotation with the data consisting of 349 participants.

According to the EFA findings, the phubbing behavior scale consisted of a single structure with eight items. Outcome beliefs toward phubbing showed a two-factor structure with ten items, comprising positive beliefs (five items) and negative beliefs (five items). Similarly, outcome evaluations toward phubbing also displayed a two-factor structure with ten items: positive evaluations (five items) and negative evaluations (five items). The EFA also discovered a unidimensional structure with six items to assess social norms regarding phubbing. The scale assessing social roles relevant to phubbing revealed a unidimensional structure with five items. A single-factor structure with four items was found to measure self-concepts related to phubbing. Affect toward phubbing revealed a two-factor structure with eight items comprising positive emotions (four items) and negative emotions (four items). Phubbing habits maintained an unifactorial structure with nine items. Facilitating conditions of phubbing had a unidimensional structure with seven items, and phubbing intentions showed a single-factor structure with five items.

Taken together, this dissertation could confirm and verify that the sample obtained for Study 1 was suitable for the EFA approach by meeting the cut-off values of KMO and Bartlett's test. In Study 1. this study could identify the number of factors that explain each

construct of TIB, which in turn helps to understand and clarify newly developed scales and guide Study 2b's CFA.

Discussion of Study 2a

The purpose of Study 2a was to (a) confirm and test the factor structures of each scale developed in the EFA through CFA in a new sample and (b) examine the reliability and validity of the scale using Cronbach's alpha (α), composite reliability (CR), average variance extracted (AVE). Each scale was trimmed and refined by evaluating the goodness of fit and making changes to the models using CFAs. According to the CFA results, it was demonstrated that each final scale had an acceptable fit, meeting the specified criteria for global fit indices (i.e., CFA $\geq$ .90, RMSEA $\leq$ .08, and SRMR $\leq$ .08).

Specifically, the final model of phubbing behavior scale, constructed with a unifactorial structure with six items, fitted well. The CFA findings supported the adequacy of a second-order two-factor of attitudes toward phubbing, which included eight items representing positive beliefs (four items) and positive evaluations (four items). The social norms regarding phubbing scale, consisting of five items, and the social roles relevant to phubbing with four items exhibited acceptable model fits. Similarly, the self-concepts relevant to phubbing, constructed with four items, showed an acceptable fit. In addition, affect toward phubbing, organized into two factors and eight items, consisting of positive emotions with four items and negative emotions with four items, demonstrated a good model fit. A single-structure phubbing habits model with nine items showed an acceptable fit. Facilitating conditions of the phubbing scale, represented by a unifactorial model consisting of seven items, also fit well. Lastly, the phubbing intentions scale, structured with a single factor composing four items, showed satisfactory goodness-of-fit indices. Along with the acceptable model fits of the models, each scale in this dissertation had high Cronbach's alpha

and composite reliability levels. Therefore, it was concluded that all the developed scales had strong reliability and internal consistency.

Discussion of Study 2b

As the first purpose of this dissertation, Study 2b examined TIB in the context of phubbing by testing the hypotheses suggested by TIB. This study investigated the associations between the framework's components to predict individuals' phubbing. The SEM results in Study 2b demonstrated TIB as an effective and applicable theoretical foundation for predicting and explaining individuals' phubbing behavior. All the hypotheses were supported, revealing that all predictors from TIB were significantly associated with phubbing behavior. More specifically, individuals' attitudes toward phubbing stemmed from outcome beliefs and outcome evaluations toward phubbing behavior; social influences derived from self-concepts, social norms, and social roles; and affect toward phubbing were significant predictors of phubbing intentions. The findings also showed that phubbing intentions, habits, and facilitating conditions significantly predicted phubbing behavior. These findings are discussed in detail below.

Predictors on Phubbing Intentions

As mentioned in Chapter 2, TIB (Triandis, 1977) focuses on attitudinal, social, and affectional factors to predict intentions as conscious aspects of a particular behavior. The theory assumes that behavioral intentions are awareness of one's actions. TIB is broken down into three conceptual antecedents leading to behavioral intentions, and the first three hypotheses of this study address them (see Figure 2).

Attitudes toward Phubbing. The first hypothesis (H1) examined the relationships between attitudes toward phubbing and phubbing intentions. This study demonstrated that individuals' intentions to engage in phubbing are strongly predicted by their attitudes toward phubbing behavior, which were determined by outcome beliefs and outcome evaluations

relevant to phubbing behavior. Particularly, if people held positive attitudes toward phubbing, such as having positive outcome beliefs and positive favorable judgment toward the consequences of phubbing behavior, they were likely to have stronger intentions to engage in such behavior. Individuals who perceive that phubbing leads to beneficial and good outcomes and who positively evaluate its consequences tend to be motivated and eager to phub others.

This result aligns with TIB by emphasizing the role of attitudes in shaping behavioral intentions (Triandis, 1977). According to TIB, attitudes directly influence one's intentions to engage in a specific behavior. Regarding phubbing behavior, Büttner et al. (2022) found a positive association of attitudes with phubbing behavior. It is plausible that individuals with positive attitudes intentionally exhibit phubbing behavior as a way to maintain cognitive consistency. That is, people prefer to be aligned with their attitudes and beliefs. Indeed, according to the theory of cognitive consistency (Festinger, 1957), human beings tend to be coherent and harmonious with their beliefs, attitudes, and behaviors. In addition, when their beliefs and attitudes are inconsistent and conflicted, people feel discomfort and psychological tensions, which is called cognitive dissonance (Festinger, 1957).

Consequently, to mitigate such negative feelings triggered by cognitive dissonance, people intentionally change their beliefs, attitudes, or behaviors that would produce consistency between them (Festinger, 1957). In this regard, individuals who hold positive attitudes toward phubbing show strong motivations and willingness to engage in this behavior because they find comfort and psychological stability, as their attitudes and behavioral intentions are consistent in their attitudes and intentions.

Taken together, these results suggest that positive attitudes toward phubbing behavior are driven by positive outcome beliefs and positive outcome evaluations, which promote people to have stronger intentions to engage in phubbing behavior.

Social Factors of Phubbing. The second hypothesis (H2) investigated how social factors derived from social norms, social roles, and self-concepts were related to phubbing intentions. The results of this study demonstrated positive and significant relationships between these social factors and phubbing intentions. In particular, individuals were likely to report strong intentions to engage in phubbing behavior if they thought it was prevalent and socially acceptable within their group and society and if they perceived that other people surrounding them approved of such behavior. In other words, as people have higher levels of strong injunctive and descriptive social norms, they express stronger intentions to phub others.

This positive association between social norms and phubbing intentions is supported by TIB (Triandis, 1977) and other research that highlights the significance of social norms in affecting behavioral intentions (Asch, 1951; Ajzen, 1985; Rimal, 2008). Specifically, the theory of planned behavior (Ajzen, 1985) and the idea of normative social influence (Asch, 1951) assert that people typically follow social norms when engaging in a given behavior. This tendency is because human beings are social animals. Individuals are instinctively eager to blend in with others in their social groups to obtain acceptance and prevent potential rejection or isolation from others (Cialdini & Goldstein, 2004). Thus, people comply with social norms and reflect them in their behaviors because they desire to feel a sense of belonging (Cialdini & Goldstein, 2004). In this context, people show different levels of behavioral intentions to engage in phubbing behavior, depending on how they consider normative in their social groups. As they typically observe phubbing behavior in their social groups (i.e., the prevalence of phubbing behavior) and they believe other people also expect to consider phubbing as being appropriate (i.e., beliefs that other people also believe phubbing is acceptable), as part of conscious processes, social members are likely to develop strong wiliness to phub others.

People who strongly identified with specific social roles associated with phubbing (e.g., viewing themselves as typical phubbers in specific social roles) were also inclined to express stronger intentions to phub others. These findings are consistent with TIB (Triandis, 1977) and can be further understood through role theory (Biddle, 1979). According to role theory, individuals absorb social roles through socialization and learning processes, leading them to develop behavioral intentions consistent with their expectations of those roles. In general, an individual occupies various social roles (e.g., friends, romantic partners, and students), and each one comes with different expectations of how they behave. In this sense, in terms of phubbing behavior, people show different degrees of behavioral intentions depending on their social roles. If individuals believe their role is proper in using their phones in social settings, they are likely to form stronger intentions to engage in phubbing behavior. In other words, people are more likely to plan to engage in phubbing behavior when they believe their phubbing behavior is acceptable and appropriate under their social roles.

Similarly, those who identified themselves as phubbers strongly intended to phub others. This finding is supported by the identity-based motivation model (Oyserman, 2007). As a psychological framework, the model provides insights into how individuals' identities – specifically, their self-concepts – influence their behaviors and decision-making process. The model emphasizes that people tend to behave in ways that align with their self-concepts (Oyserman, 2007). Since human behaviors are congruent with how they define themselves, it is reasonable to predict phubbing behavior through self-concepts. When people perceive themselves as phubbers or provide reasonings supporting their phubber self-concepts, their intentions to engage in phubbing behavior intensify. This is because they feel more secure and comfortable when their phubbing behavior and self-concept as phubbers are constant.

Taken together, social factors are intertwined with norms, social roles, and self-concepts. All of them play significant roles in predicting behavioral intentions in the context

of phubbing. More specifically, intentions to engage in phubbing behavior are understood collectively by how people perceive social norms, how they align their social roles to phone usage behavior in interpersonal settings, and how they define themselves in behaving it. That is, people are likely to exhibit stronger intentions to engage in phubbing when strongly perceiving that phubbing behavior is prevalent and other people approve of phubbing behavior and when believing that it is appropriate under their social roles and identify themselves as phubber,

Affect toward Phubbing. The relationship between affect toward phubbing and phubbing intentions was examined in the third hypothesis (H3). The findings of this study showed that emotional responses toward phubbing behavior significantly predicted phubbing intentions. In other words, individuals who felt positive emotions in phubbing – that is, who found it enjoyable or pleasing – exhibited greater intentions to engage in phubbing behavior.

This result is consistent with TIB (Triandis, 1977), which asserts that behavioral intentions are increased by pleasant emotional experiences relevant to a given action. The relationships between affect and intentions are also reflected through psychological principles. People tend to avoid behaviors that induce negative feelings (Baumeister et al., 1994; Erez & Isen, 2002). If people perceive such behavior triggers threats or damages their psychological well-being, they are unwilling to engage in it. It is due to human beings' inherent desire for emotional well-being and psychological stability (Maslow, 1943). In this regard, it is plausible that emotional experiences in phubbing behavior significantly predict phubbing intentions. If people experience negative feelings, such as guilt and selfishness, while using their phones in the presence of others, they endeavor to control such behavior. That is, they consciously strive to refrain from engaging in phubbing behavior by reducing their intentions. Thus, they protect themselves from negative feelings and psychological tensions.

Overall, affective factors – emotional responses toward phubbing behavior – serve as significant predictors of phubbing intentions. Thus, it is necessary to consider these factors in understanding how individuals' conscious behavioral intentions are determined. It is because positive emotions facilitate people to exhibit stronger intentions to engage in a particular action, while negative feelings suppress them.

Predictors of Phubbing Behavior

The remaining hypotheses of this research investigated how intentional, habitual, and environmental factors contributed to predicting phubbing behavior. According to the results of SEM, these three main factors – intentions, habits, and facilitating conditions – were significant predictors of phubbing behavior. Through these findings, this dissertation's second purpose – answering whether phubbing is a conscious, unconscious, or a mixture of both behaviors – could be achieved. Their detailed discussions are indicated in the following.

Phubbing Intentions. The fourth hypothesis (H4) illustrated how phubbing intentions were associated with phubbing behavior. This dissertation found that phubbing behavior resulted from phubbing intentions. In other words, people with stronger intentions to engage in phubbing were prone to phub others. This finding is consistent with TPB by Ajzen (1985), pointing out behavioral intentions as proximal determinants of eventual behavior (Ajzen, 1985). That is, intentions to engage in a particular behavior are the most influential factors leading to the behavior. (Ajzen, 1985; Deci & Ryan, 1985). Intentions, as cognitive processes, are fundamental to human behavior because they reflect motivations, plans, and goals (Ajzen, 1985). That is to say, individuals who have specific needs or desires are driven to act in ways that satisfy them. In this process, intentions link motivation and action by converting abstract objectives into specific actions. Also, regarding the goal-oriented aspect of behavior, people are more inclined to engage in it when anticipating that doing so will lead to desired results. As such, there are active mental activities – planning, reasoning, and goal-

setting – that contribute to shaping and guiding a certain action. Therefore, intentions have a direct impact on how people behave. In this regard, phubbing behavior can be accounted for by strong intentions. Individuals who plan to use their phones have strong goals and motivations. For example, people use their devices to communicate with others, keep up with the latest information, and play games for entertainment. These people believe using their phones can achieve these motivations and goals. Consequently, they might show stronger phubbing intentions by planning, justifying, and setting goals to use their phones in interpersonal situations. Thus, they engage in phubbing behavior. Overall, this result suggests that phubbing intentions directly predict phubbing behavior.

This finding was especially significant because it allowed us to conclude that phubbing is a conscious behavior motivated by individuals' intentions, plans, and motivations to phub others. Since it acknowledges phubbing as a deliberate and conscious behavior, this study has theoretical and practical implications; they will be thoroughly discussed in the implication sections.

Phubbing Habits. The fifth hypothesis of the present study (H5) predicted that there would be a positive association between habits and phubbing behavior. As predicted, phubbing habits had a direct and positive association with phubbing behavior. People with strong habitual tendencies to use their phones during face-to-face interactions were more prone to phub others. The finding lines up with TIB, which asserts that habits are one of the strong predictors of human behavior. Habitual tendency prompts a performance due to its automaticity, repetition, and consistency over time via a process of reinforcement (Skinner, 1953). In other words, when people repeatedly and frequently show a specific behavior, such behavior becomes routine and ritual, leading to acting on it with minimal consciousness. Habits relieve an individual from having a conscious process; instead, they should be equated with unconsciousness (Limayem et al., 2004; Sheeran et al., 2005). In this regard, when

someone repeatedly uses their phones during social interactions, such performance becomes more automatic over time. It reinforces the habit loop, making them more likely to engage in phubbing behavior.

Similar to the results of the association between phubbing intentions and phubbing behavior, this finding is also critical in that phubbing should be considered an unconscious behavior. It is because habits that explain unconscious aspects of a certain behavior directly impact phubbing behavior. Addressing phubbing simply by conscious or decision-making processes should be challenging. Rather, phubbing also must be understood as a deeply ingrained automatic or habit-forming action. All things considered, these findings indicate that phubbing should be understood as a mixture of both conscious and unconscious behavior. The sections on implications will provide concrete discussions of this part.

Facilitating Conditions of Phubbing. The sixth hypothesis (H6) explored how facilitating conditions were related to phubbing behavior. The study findings support the idea that facilitators – external cues – were positively associated with phubbing behavior. In other words, individuals in specific circumstances that promote phubbing behavior are likely to execute phubbing behavior. This finding is in line with TIB and previous studies that highlight the role of facilitating factors on actual behavior (Milhausen et al., 2006; Pee et al., 2008; Triandis, 1977). These studies point out that even if people deliberately plan to engage in a certain behavior with stronger intentions, it is almost impossible to execute it unless environments or situations underpin such behavior. For instance, although someone strongly intends to go to the gym, some external factors (e.g., car trouble and deteriorating weather conditions) impede them from exercising at the fitness. In phubbing behavior, individuals are likely to phub others when exposed to specific environmental and situational contexts. For example, when their phones ring or beep and when conversations are at a lull, phubbing

behaviors are inclined to be observed. That is, external and situational cues encourage phubbing behavior.

Taken together, this finding suggests a new approach, along with conscious and unconscious aspects of phubbing behavior. That is, phubbing behavior is determined by not only internal factors, including conscious and unconscious elements, but also external and environmental cues. It suggests that phubbing should be addressed through the lens of consciousness, unconsciousness, and environmental cues.

Summary of Findings

This research empirically demonstrated that attitudinal, social, and affectional factors were directly associated with phubbing intentions. These intentions, in turn, had strong impacts on phubbing behavior. In addition, phubbing habits and facilitating conditions promoted phubbing behavior, respectively. The TIB test and its associated hypotheses provide empirical evidence to explain phubbing behavior. As a multidimensional behavior, phubbing should be understood through intentional, habitual, and external perspectives. In other words, a comprehensive phubbing behavior – the practice of using a phone within interpersonal contexts – is not merely a conscious or deliberate behavior. Instead, phubbing combines conscious, unconscious, and environmental cue-based behavior.

Implications of Study

Despite the growing prevalence of phubbing behavior, research on applying a well-developed theory to the context of phubbing and its quality and measurement is scarce. The present study provides academia and researchers with a number of theoretical, methodological, and practical implications, which are discussed in detail below.

Theoretical Implications

This dissertation makes significant contributions to the literature on phubbing and TIB. First, previous research has paid little attention to applying an entire grounded theory to

understand why individuals engage in phubbing behavior. More specifically, despite the fact that TIB by Triandis (1977) has more predictive power to predict human behaviors than other theories, such as TRA and TPB (Egmond & Bruel, 2007; Gagnon et al., 2003; Pee et al., 2008), no studies have used this theory to understand what factor specifically determines phubbing behavior. In order to discover these unexplored areas and further advance the literature, this dissertation, as the first study, employed TIB as the theoretical framework. By testing and demonstrating TIB in the context of phubbing with the acceptable fit result as a whole, this study contributes to empirically confirming the assumptions and their relationships between the variables suggested by TIB, which, in turn, helps us to capture and explain the phenomenon of phubbing behavior accurately. This study further solidified the theoretical basis for future studies and offered a new approach to comprehending individuals' phubbing behavior.

Second, this study includes heuristic values as applying TIB to phubbing behavior. TIB was initially developed to understand traditional interpersonal behaviors within social interactions, such as communication patterns and relational dynamics in different contexts (e.g., Semanko, 2021). TIB has not previously been employed to investigate technology-related behaviors, including phubbing. In this regard, this dissertation's results – the excellent fit of the overall conceptual TIB in phubbing – contribute to expanding its adaptability beyond conventional interpersonal contexts. In other words, the theoretical bounds of TIB are extended to new areas that have not been explored yet. It enables researchers to extend the theory's scope into other human behaviors, especially relevant to technology use (e.g., cyberbullying, addictive/overdependent technology use, the spread of fake news, and body image comparisons). This forward-thinking approach using TIB will have significant theoretical implications as well. As valuable guidance for future studies, it will be helpful for researchers to formulate and refine hypotheses and design their studies with topics relevant to

broader technology usage behaviors. Also, the researchers will gain deeper insights into the complex human interactions influenced by information and communication technologies, thus improving the understanding of general human behaviors.

Third, in light of TIB, this research contributes to identifying not-explored specific factors – habits, affect, social roles, and self-concepts – to predict phubbing behavior. In addition to these unexplored factors, this study empirically demonstrated the significant relationships between TIB variables and phubbing behavior by examining each TIB element. It suggests that the variables within TIB collectively possess predictive and explanatory powers of phubbing behavior. Specifically, attitudes toward phubbing (derived from outcome beliefs and evaluations toward phubbing), social factors of phubbing (including norms, social roles, and self-concept), and affect toward phubbing were significant predictors of phubbing intentions. These intentions, phubbing habits, and facilitating conditions were further shown to be significant predictors of phubbing behavior. These integrations of attitudes, social influences, emotional responses, habitual tendencies, and environmental cues offer theoretical and empirical support for explaining phubbing behavior. Consequently, this study contributes to gaining rich insights from diverse perspectives.

Fourth, this dissertation also has profound theoretical implications in that phubbing is a conscious and unconscious behavior. External cues further facilitate such behavior. Specifically, this dissertation found that phubbing behavior was driven by conscious intentions, encompassing their attitudes, social factors, and affections toward phubbing behavior. Strong intentions to engage in phubbing were identified as a significant predictor of actual phubbing behavior. In addition, this study revealed the role of unconsciousness in phubbing behavior, focusing on habitual tendencies. Habitual and automatic smartphone use during face-to-face interactions was related to increased tendencies to phub others. The results of this dissertation also emphasized the significant roles of external facilitating cues

on phubbing behavior. Environmental cues (e.g., phone notifications or conversational lulls) were identified as triggers that make individuals exhibit phubbing behavior more often. Taken together, to conceptually and theoretically explain why and how phubbing behavior occurs, these results suggest the importance of considering individuals' conscious decision-making processes, unconscious levels, and situational contexts; the following provides the theoretical implications of these significant relationships.

The following breaks down the significant associations in detail. This research obviously clarified that social factors emerged as the strongest predictor of phubbing intentions among three TIB variables (i.e., attitudes, social factors, and affect). It implies that the decisions on whether individuals would engage in phubbing behavior heavily depend on social norms, perceptions of social roles, and self-concepts regarding phubbing behavior. Comprehensively speaking, social factors indeed function as the main catalyst inducing individuals to engage in phubbing behavior. This conclusion is based on the results that the magnitude of the coefficient between social factors and phubbing intentions was greater than others, compared to between attitudes and intentions and between affect and intentions.

Furthermore, it is concluded that phubbing behavior is a socially embedded phenomenon. Phubbing is not merely a personal matter. Instead, such behavior should be understood through societal viewpoints, such as socially collective norms and individual perspectives. Furthermore, this viewpoint confirms evolutionary epistemology that human beings are social species. As creatures evolve to be social, their behaviors are heavily influenced by surrounding others by seeking out others' conformity within their social environments.

Overall, from these findings, attitudes, social influences, and affect are intertwined in their cognitive process and serve roles in determining their behavioral intentions. In this regard, this study contributes to improving an understanding of how people judge the

outcomes of a given behavior, how they interpret and perceive their social world, and how they feel about the behavior, which determines whether they behave. Specifically, by demonstrating how these cognitive factors interact in shaping behavior intentions, this study contributes to behavioral decision-making theories by increasing the understanding of the multifaceted processes from their individual choices to actual behavior. This dissertation's findings also contribute to social cognitive theories by emphasizing the reciprocal interactions between cognitive processes and social influences in determining behavior, advancing how people's behavior from social perspectives.

In summary, by unpacking these cognitive processes into attitudinal, social, and affective perspectives, this study's findings contribute to theoretical knowledge about TIB and its applicability to phubbing behavior. Therefore, these findings can offer opportunities to extend theoretical frameworks in behavioral science and social psychology, providing further understanding of technology-related behaviors and their implications for interpersonal interaction and social dynamics.

Methodological Implications

This dissertation also provides numerous methodological implications for academia and researchers. First, the development of measurements is an essential stage in the field of social science, especially when there are no existing scales to measure the phenomena of interest (Devellis, 2016). The author also argues that researchers must develop new scales that precisely capture the intended constructs. In this sense, as the first study, all TIB constructs' instruments – 11 constructs of TIB – were developed in this dissertation and empirically verified to ensure their effectiveness and usefulness through EFA and CFA using a quantitative approach.

This study provides valuable foundations for measuring phubbing behavior and its predictors from TIB. For instance, all the scales that were developed in this dissertation (e.g.,

phubbing behavior, outcome beliefs toward phubbing, outcome evaluations toward phubbing, social norms regarding phubbing, social roles relevant to phubbing, self-concepts relevant to phubbing, affect toward phubbing, phubbing habits, facilitating conditions, phubbing intentions) can be used when future research investigates the nature and dynamics of phubbing behavior. These validated scales can also be used when developing more specific relational-focused phubbing and other relevant predictor scales in greater depth. Previous studies, for instance, have demonstrated that phubbing happens in different types of relationships, from friendships and romantic to boss-employee relationships (Beukeboom & Pollmann, 2021; Roberts & David, 2020; Sun & Samp, 2022). It will be a great asset for future studies to measure phubbing behavior and its relevant predictors in different relationship contexts by modifying the developed scales slightly, such as replacing the statements' wordings *others* to *friends*, *romantic partners*, or *boss*.

In addition to being the first study to develop all the components of TIB, this study also contributes to overcoming the limitations of existing phubbing scales. For instance, Karadağ and colleagues (2015) developed the phubbing scale. However, several of their items did not fully reflect phubbing behavior. Instead, their statements leaned toward addictive and problematic related behaviors in using phones. Moreover, in developing their scales, the authors skipped the process of face and content validity. This dissertation developed a new phubbing behavior scale by seeking to reflect phubbing behavior itself and conducting face and content validity through the experts' review. As a result, compared to the existing ones, the phubbing scale developed in this study is easily applied to general phubbing behavior happening in daily life and, thus, fills the critical measurement gaps in the current literature.

Finally, the newly developed scales in this study contribute to advancing TIB by operationalizing abstract theoretical constructs into assessable variables. All the constructs of

TIB – attitudes, beliefs, affect, social norms, social roles, self-concepts, and habits – are complex and abstract concepts that are not directly observable. By operationalizing and validating those concepts through EFA and CFA, this study provides empirical evidence of the measurement accuracy of each concept and their roles in explaining why individuals phub others. As a result, the applicability and ability of the entire TIB framework to predict phubbing behavior are empirically evaluated and validated.

Practical Implications

This study has significant implications for practitioners and professionals in various fields, especially for phubbers (i.e., individuals engaging in phubbing) and campaign developers. The results of this research emphasize how all individual, social, and external factors intertwine to impact phubbing behavior prediction. More specifically, it was found that phubbing intentions, habitual phubbing, and facilitating conditions significantly predicted phubbing behavior, respectively. In other words, the stronger intentions people have to phub others, the more likely they are to engage in phubbing behavior. Individuals tend to engage in phubbing behavior as they have habitual tendencies to phub others. When people are exposed to specific environments, they are more likely to engage in phubbing.

These findings are essential to those who engage in phubbing behavior (i.e., phubbers). They allow phubbers to have opportunities for self-improvement and behavior change. Specifically, readers of this study, especially phubbers, will take time to examine themselves. While reading this research, they will recall how they treated their conversation partner and whether they used their phones while interacting with their partners. Consequently, phubbers will introspect about their past phubbing behavior (e.g., the frequency of their phubbing behavior) and their general beliefs, attitudes, emotional experiences, and social influences regarding phubbing. Based on these introspections, they will take proactive steps to restrain the action further. Phubbers will seek to change their

perceptions and attitudes toward phubbing behavior to reduce it. Therefore, they will engage in such behavior less in future interpersonal interactions. Also, phubbers will attempt not to be exposed to possible external cues that trigger phubbing. For example, they will consciously create no-phone zones (i.e., they put their phones away beforehand), particularly when other people are around (e.g., when it is time to have meals and converse with others). As a result, they will develop more healthy technology usage patterns and further strengthen relationships by ensuring that they care about their partners and are interested in their interactions.

Second, the results of this study play leading roles in technology-related campaign settings. The campaigns are crucial for informing the public – especially smartphone users – about the dangers and consequences of phubbing behavior. They ultimately target promoting a culture of responsible and healthy technology use, particularly with regard to smartphones. In this sense, the dissertation's findings should be used to develop more effective stop-phubbing strategies and campaigns, with the idea of emphasizing how precious and valuable their interpersonal interactions and surrounding people are to their lives.

Stop-phubbing campaigns, for instance, should concentrate on changing individuals' attitudes toward the act of phubbing. If someone attaches positive values to the consequences of phubbing, they will become more prone to phub others. Therefore, these campaigns should focus on changing people's perceptions (including beliefs and evaluations) regarding the potential outcomes that are perceived to be gained from phubbing. These perceptions can be altered when campaign developers tailor their messages by emphasizing the adverse outcomes of phubbing behavior. They can include some key messages and slogans in their campaigns. Examples are: "Phubbing kills conversation and relationships," "Do not let your screen hurt others sitting in front," "Your special others would be forgotten as you use your phone," "Put down the phone, focus on your partner," and "Do not let your phone break your

real connections.". Campaign developers should include such negative tones in their messages, and thus, their target audiences (e.g., the public with smartphones) change their positive perceptions toward phubbing into more negative ones. Consequently, people's intentions to engage in phubbing will be weaker because positive stimuli are removed, and people will perceive such behavior negatively. As negative stimuli result in discomfort (Festinger, 1957), they decrease the likelihood of phubbing intentions.

It is also essential for campaigns to focus on social factors due to their greatest predictive power of phubbing intentions. Campaign strategies must raise the public's recognition that phubbing behavior is socially unacceptable. As such awareness is strengthened, people will express less intention to engage in phubbing behavior. In this sense, social pressures play a positive role in reducing poor behaviors. Stop-phubbing strategies should also include changing individuals' emotions that are generated by the act of engaging in phubbing behavior. Furthermore, campaigns should put more energy and emphasis on objective conditions present in the external environments that facilitate phubbing behavior. Some potential tactics to lessen phubbing, for example, include creating phone settings that limit distractions by turning on "do not disturb" mode during in-person conversations.

Collectively, based on the findings of this study, these professionals put more effort into and include the prevention strategies mentioned above to alleviate phubbing behavior. These efforts contribute to leading to cultures of healthy relationships and treating others with respect. At the same time, people will learn essential smartphone etiquette for any situation, from personal to professional contexts.

Limitations and Directions for Future Research

Although this dissertation's findings had theoretical, methodological, and practical implications, several limitations should be noted. First, this dissertation is limited by the sample characteristics. In addition, this study includes methodological constraints. Third, the

presence of high VIF between certain variables in this study is notable. The following section explains these limitations in detail and provides directions for future studies.

The two samples of this dissertation were collected from adults living in the United States only. The lack of diverse samples may make generalizing the findings to countries with different cultural backgrounds difficult. These cultural factors can be noteworthy in understanding phubbing behavior, as cultural values shape attitudes and behavior toward smartphone use (Jung et al., 2015). For instance, based on one of Hofstede's four cultural dimensions (Hofstede, 1983), Jung et al. (2015) compared two countries – the United States and Korea – as representative individualistic and collectivistic countries to explore how individuals from different countries adopt and use smartphones differently. Their study found significant differences between these two countries in smartphone adoption, such as Korean participants being more likely to have a stronger association of social influences to behavioral intention than participants in the United States. Their study also demonstrated that Korean smartphone users were more sensitive to social pressure in developing behavioral intentions. However, the impact of facilitating conditions on smartphone use intention was greater in the United States than in Korea.

Similar to their conclusions that cultural differences exist in accepting and adopting smartphones, they influence how people experience phubbing and respond to it (Vanden Abeele, 2020). People show phubbing behavior differently depending on their cultures because of cultural differences in how they are concerned about their face (i.e., self-image when interacting with others; Ting-Toomey, 1994) and which strategies they use to save their face. Indeed, individuals from collectivistic cultures (e.g., China and Japan) tend to be more concerned about maintaining their face than those from individualistic cultures (e.g., the United States and Germany) (Oetzel & Ting-Toomey, 2003). Specifically, collectivists seek to protect their reputation and honor in social interactions to avoid embarrassment or loss of

their social status. In this sense, people from collectivistic cultures may tend not to engage in phubbing. The reason is that phubbing is seen as a face-threatening behavior, as others typically see phubbing as inappropriate behavior in social situations (Pew Research Center, 2015). Therefore, this study expects that collectivistic people will decide not to show phubbing behavior to save face and remove any threat to damage their reputation.

Accordingly, it is highly recommended that future studies explore cross-cultural variations in phubbing behavior within TIB by gathering and comparing culturally diverse samples. It will contribute to fully comprehending phubbing behavior and examining the distinct roles of cultural influences on it. At the same time, by testing TIB with culturally diverse samples, future research will contribute to understanding its applicability and validity across different cultural contexts.

The second limitation is that this study developed and measured phubbing behavior and its relevant predictors from TIB only using self-reported measures. Due to social desirability effects, self-reporting is sensitive to bias (Fisher & Katz, 2000). This study's participants can underreport their phubbing behaviors, attitudes, and beliefs toward phubbing behavior because it is socially undesirable. This bias may, in turn, lead the frequency and prevalence of phubbing behavior to be underestimated and distorted. For instance, someone actually uses their phone almost every moment, regardless of the presence of others. However, rather than reflecting their true behavior, they may underreport their frequency to be regarded as more virtuous and respectful partners. In addition to this possible bias, the self-reported method may not fully capture the complexity and variability of participants' true phubbing behavior. The reason is that, as demonstrated in this dissertation, phubbing is partially determined by an unconscious process. Therefore, participants might have had difficulties recalling and reflecting on their actual phubbing behavior when completing the questionnaires for this study. Beyond this measurement issue, the use of PCA with varimax

rotation for EFA in Study 1 is another limitation of the methodological approach. Although PCA with varimax has been widely used in previous studies to explore factors, they may not be the best way to conduct EFA.

Future studies should complement self-report data with objective measures (e.g., observational studies and behavioral tracking) and qualitative approaches (e.g., interviews and focus groups) to overcome the second limitation above. Consequently, the developed measurements will have more validity and reliability related to phubbing and its predictors. This study also suggests future research to implement a longitudinal study design. For instance, researchers should administer surveys multiple times over an extended period, such as weeks or months. These combined longitudinal surveys with self-reported data enable us to examine changes in participants' responses regarding phubbing behavior and its relevant predictors from TIB over time across different processes of observation. This comprehensive approach will advance knowledge in phubbing literature by offering valuable insights into the dynamic phubbing trends. In terms of EFA, the use of different techniques – for instance, ML and oblique rotation (i.e., Oblimin) – is suggested for future studies, as some factors of this study were highly correlated. Through these solutions, the methodological limitations of this dissertation will be resolved.

Third, as detailed in Chapter 5, the findings of this study revealed a VIF of 4.96 between phubbing habits (a predictor variable) and phubbing behavior (an outcome variable). The high VIF may occur because the predictors of this study in SEM were highly correlated with each other. Although the value per se met the cut-off criteria in this study (VIF < 5), it is essential to acknowledge and address the elevated VIF value. The reason is that the higher the VIF, the higher the possibility to increase standard errors of regression coefficients and to influence the interpretability of regression coefficients (Hair et al., 2010). That is, isolating each predictor's unique effects on the outcome variable is challenging. In this regard, it may

be challenging to understand which predictors truly drive changes in phubbing behavior. Also, the model, including possible multicollinearity issues, may produce unreliable results, which reduce the overall validity and generalizability of this dissertation's findings.

Future studies are required to mitigate possible multicollinearity to address the third limitation. According to Hair et al. (2010), repetitive or similar predictors that frequently exhibit high correlations raise the VIF and cause multicollinearity. Therefore, a useful strategy is thoroughly assessing and eliminating any redundant predictors from the model. It is also recommended that future studies gather more data, as a larger sample size increases predictor variability and thus reduces the possibility of multicollinearity. In addition, future researchers need to consider using different modeling techniques that are less susceptible to multicollinearity, including regularization methods based on lasso regression (Tibshirani, 1996). Consequently, the interpretability and the ability to examine the distinctive role of each construct in predicting phubbing behavior will be increased.

Beyond these limitations and their possible solutions, this study recommends further directions for future studies. First, it will be worthwhile for further research to examine other sociodemographic-level factors to predict phubbing behavior. For instance, although age and gender were not significantly related to phubbing behavior in the entire TIB framework, it was found that there were significant differences in phubbing behavior across age groups: $F(4, 806) = 12.50$, $p < .001$. More specifically, post-hoc Tukey tests revealed that age groups differed significantly at $p < .05$; between 18-24 and over 55 years old groups, between 25-34 and 45-54 years old; between 25-34 and over 55 years old, between 35-44 and over 55 years old. In this regard, generational differences in phubbing behavior are expected. This study encourages future researchers to examine it by comparing younger and older generations.

Along with the generational differences, more diverse factors need to be explored within the TIB framework, and they may serve as moderators for predicting phubbing

behavior. Possible moderators can be individual- and relational-level factors. For instance, closeness and intimacy can be key moderators of relationships. Indeed, people tend to engage in phubbing behavior more frequently, especially when they are with others who are closer to them than those who are not (Al- Saggaf & O'Donnell, 2019). In particular, phubbing is more commonly displayed to people with their friends, romantic partners, and family members (i.e., close others) than with strangers who are considered distant relationships (Al-Saggaf & MacCulloch, 2019).

Regarding individual-level factors, previous studies have demonstrated that FoMO and insecure attachment styles (i.e., anxious-preoccupied and dismissive-avoidant attachment styles) have direct positive impacts on phubbing behavior (Balta et al., 2020; Sun & Miller, 2023). In this regard, the effects of predictors suggested by TIB will vary depending on the level of these possible moderators. For instance, the effects of intentional, habitual, and external factors on phubbing behavior will be stronger, especially when people have higher levels of FoMO and insecure attachment styles.

Taken together, these suggested directions outline potential paths for future studies and contribute to the scholarly discourse and knowledge about phubbing behavior. Consequently, the literature on phubbing and TIB will be activated, and a great wealth of information will be given to future researchers interested in the phubbing phenomenon.

Conclusion

Phubbing is a toxic behavior that impacts partners, conversations, and relationships. As it is becoming increasingly common and prevailing, this research used a unique and comprehensive framework to understand phubbing behavior. Specifically, this study applied and tested the theory of interpersonal behavior to examine the various predictors that may lead to phubbing behavior. Multiple factors such as intentions to phub others (i.e., from the attitudinal, social, and affective factors), phubbing habits, and facilitating conditions were

found to predict phubbing behavior simultaneously. In addition, the scales developed in this study provide reliable and valid measurements for assessing all the constructs of TIB in the context of phubbing. Based on these results, which are consistent with TIB, this study concludes with the argument that phubbing is a conscious and unconscious behavior.

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