**Encyclopedia of Mobile Phone Behavior:**
**Mobile Phone Addiction**

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**ABSTRACT**

This chapter reviews the literature on <mark>mobile phone addiction</mark>, the excessive use of mobile phone technology, which is an impulse control disorder with negative social and psychological consequences. It provides a clear definition of mobile phone addiction, along with its theoretical origin, diagnostic criteria for assessment, and an identification of the symptoms and consequences of addictive behavior. More importantly, it summarizes key predictors of this addictive behavior from a psychosocial perspective. The chapter also points out potential relationships between mobile phone addiction and other social behaviors. Finally, it discusses limitations of the assessment criteria for mobile phone addiction and makes suggestions for future research.

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**INTRODUCTION**

Recent technological developments have turned mobile phones into multifunctional machines for everyday use. The arrival of the ==smartphone== brought convenience to interpersonal conversation, social networking, agenda management, entertainment, shopping, and other personal activities. Probably no other modern device is embedded into our lives as deeply as the mobile phone. However, an alarming consequence of this embedding has begun to emerge. Excessive dependency upon this technology leads to serious psychological and behavioral impacts on mobile phone users. In particular, as mobile phones embrace features and capabilities from laptop computers and telecommunication technologies, such as easy-to-use interfaces, mobility, Internet access, interactive games, and access to social media (e.g., Facebook, WhatsApp, and Instagram), the potential risk of uncontrolled use increases greatly.

In recent years, studies have shed light on the behavioral health issues related to the problematic use of mobile phones. Examining the literature, we can find a group of similar terminologies that fall under the conceptual umbrella of problematic mobile phone use, including mobile phone addiction, mobile phone dependency, and pathological or maladaptive mobile phone use. Since these constructs were developed in similar academic disciplines (e.g., social psychology, communication, and behavioral health) using theoretical models and explanations with shared focuses and elements, these concepts are often interchangeable.

Today, as mobile phones become increasingly sophisticated and multifunctional, adolescents and young users are becoming increasingly dependent, or "addicted," to this technology, not only for interpersonal communication through voice or text (i.e., short

messaging service—SMS) but also as a tool for seeking gratification, searching for information, entertainment, relaxation, passing time, picture and video taking, and expressing status and identity, as well as currently undiscovered applications (Charlton, Panting, & Hannan, 2002; Leung & Wei, 2000). This chapter provides a clear definition of mobile phone addiction and reviews the literature surrounding it, focusing especially on diagnostic criteria, predictors, symptoms, and consequences of this addictive behavior.

## OVERVIEW

### Definition, Theoretical Origin, Symptoms and Consequences

Traditionally, the concept of "addiction" was medically based and reserved for bodily and psychological dependence on a physical substance, not behavioral patterns. However, some studies have argued that the term should be widened to cover a broader range of behaviors. Griffiths (1996) proposed the concept of technological addiction, a subset of behavioral addiction that is operationally defined as an impulse control disorder involving non-chemical human-machine interaction. Previous empirical studies have identified compulsive (or impulsive) usage as an important characteristic of addictive users (Koo, 2009; Park & Lee, 2011). There have been debates not only about whether the excessive use of technologies such as the Internet, TVs, and computers can or should be called an addiction but also about whether the excessive use of technology can be considered problematic (Griffiths, 1998).

To clinically define mobile phone addiction, it is necessary to compare it against the criteria for other, established addictions. The American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (known as DSM) has established objective and measurable criteria for assessing "substance dependence" (American Psychiatric Association,

1994). The main diagnostic criterion is a maladaptive pattern of substance use, leading to significant psychological impairment. This impairment is manifested by seven symptoms: withdrawal, tolerance, preoccupation with the substance, loss of control over the substance, more use of the substance than intended, continued consumption of the substance despite adverse consequences, and loss of interest in other social, occupational, and recreational activities.

One of the pioneers of the study of "technological addiction" is Kimberly Young. Following the criteria of pathological gambling outlined in DSM-IV, Young (1998) created eight criteria for screening addictive Internet use:

(1) Preoccupation with the Internet (e.g., thinking about previous online activity or anticipating the next online session);

(2) Requiring increasing amounts of time to achieve satisfaction;

(3) Unsuccessful efforts to control Internet use;

(4) Feeling restless, moody, depressed, or irritable when attempting to stop Internet use;

(5) Staying online longer than originally intended;

(6) Jeopardizing significant relationship, job, educational, or career opportunities because of the Internet;

(7) Deceiving others to conceal the extent of involvement with the Internet; and

(8) Using the Internet to escape from problems.

Individuals who met five of these eight criteria were classified as addicts.

Similarly, Griffiths (1998) suggested that technological addictions can be either passive or active. Extensive TV viewing is an example of a passive technological addiction. Active

technological addictions, however, involve the processes of inducing and reinforcing. Problematic computer gaming and online chatting are typical examples of active addictions. In line with DSM-IV's diagnostic criteria for substance dependence, Griffiths (1996, 2005) postulated that behavioral addictions contain a series of common components, or *symptoms*, which are comprised of six dimensions:

(1) *Salience*. The activity becomes the most important thing in an individual's life and dominates his or her thoughts (preoccupations and cognitive distortions), feelings (cravings), and behaviors (deterioration of social behavior).

(2) *Mood modification*. This subjective experience is a consequence of engaging in a particular activity (e.g., a "buzz" or "high" and/or "escape" or "numbing"), which can serve as a coping strategy.

(3) *Tolerance*. Increasing amounts of time must be spent doing a certain activity to achieve the same effect.

(4) *Withdrawal symptoms*. Unpleasant feelings and/or physical effects occur when a particular activity is discontinued or suddenly reduced.

(5) *Conflict*. This refers to conflicts between the addict and those around them (interpersonal conflicts) or within the addict's mind (intrapsychic conflict) that concern a particular activity.

(6) *Relapse*. This refers to the tendency to repeatedly revert to earlier usage patterns for a particular activity and for even the most extreme patterns, typical of the peak of the individual's addiction, to be quickly restored after many years of abstinence or control.

Thus, addictive mobile phone use can be considered an impulse control disorder that

does not involve intoxicants and is similar to pathological gambling. Bianchi & Phillips (2005) identified a number of signs exhibited by mobile phone addicts. It was found that individuals addicted to mobile phones preoccupy themselves with the phone (e.g., when they are out of cellular range for a period of time, they become worried that they will miss a call); must use the mobile phone for increasing amounts of time to achieve satisfaction; repeatedly and unsuccessfully try to control, decrease, or stop their mobile phone use; feel lost, restless, moody, depressed, or irritable when attempting to decrease mobile phone use; stay on the mobile phone longer than originally intended; hide from family, friends, or others to conceal the extent of their involvement with the mobile phone; and use the mobile phone as a way to escape from problems or relieve a dysphoric mood (e.g., feelings of isolation, anxiety, loneliness, and depression). These symptoms can also be regarded as consequences suffered by millions of mobile phone addicts. Using Leung's (2008a, 2008b) MPAS scale, Bian and Leung (2014) found that 13.5% of university students could be classified as mobile phone addicts.


**CURRENT SCIENTIFIC KNOWLEDGE ABOUT MOBILE PHONE ADDICTION**

**Mobile Phone Addiction Assessment**

Current research on mobile phone addiction has adopted strategies for modifying the existing conceptual and methodological tools used by studies on substance use, Internet addiction, and pathological gambling. Evidence from empirical studies demonstrates that these models for assessing mobile phone addiction are similar to other technological addiction scales.

Toda et al. (2004) developed the Cellular Phone Dependence Questionnaire (CPDQ) to

assess the tendency of female Japanese students to become dependent on their mobile phones. This 20-item scale mainly focuses on the behaviors associated with excessive use, showing a total variance of 43.0% and a combined Cronbach's alpha of 0.86.

Bianchi and Phillips (2005) constructed the Mobile Phone Problem Use Scale (MPPU). The 27 items included in the scale deal with issues related to tolerance, escape, withdrawal, craving, and negative consequences such as social, familial, work, and financial difficulties. The survey demonstrates excellent internal consistency among these items (i.e., a Cronbach's alpha of 0.93).

Koo (2009) developed a scale to identify cell phone addiction among Korean adolescents. This study revealed three dimensions (withdrawal/tolerance, life dysfunction, and compulsion/persistence) that explained 55.45% of the total variance. The scale was significantly correlated with scales of self-control and impulsiveness.

Leung (2008a, 2008b) proposed the Mobile Phone Addiction Scale (MPAS) by integrating dimensions from MPPU (Bianchi & Phillips, 2005), the Internet Addiction Test (Young, 1998), and the Television Addiction Scale (Horvath, 2004). The 17-item scale yielded a four-factor mobile phone addiction symptom structure, with 402 adolescents in Hong Kong explaining 60.4% of the variance. Later, Bian and Leung (2014) conducted a similar study, which examined 414 smartphone users in China. The 19-item scale yielded a clearly identifiable five-factor smartphone addiction symptom structure and accounted for 70.09% of the total variance. These factors included disregard of harmful consequences, preoccupation, inability to control cravings, loss of productivity, and feelings of anxiety and being lost. As a whole, the symptoms identified in these studies were conceptually consistent with the theoretical origins, which can be regarded as hurtful consequences, and

were described in DSM-IV as part of the diagnostic criteria of pathological gambling. In fact, DSM's original method for measuring pathological gambling was based on eight items; however, these two studies employed 17 and 19, respectively.

**Predictors of Mobile Phone Addiction**

The relationship between personality traits and problematic mobile phone use has been well documented. Previous research has explored some common predictors of mobile phone addiction, the most prominent of which are psychosocial factors, such as self-esteem, loneliness, shyness, leisure boredom, and self-control.

*Self-esteem.* Self-esteem is one of the most frequently adopted predictors in research on media behavior. It refers to individuals' self-perception of their capabilities in different aspects of their lives. Individuals with high self-esteem are more likely to have better social relationships and a higher quality of life. In contrast, individuals with low self-esteem usually lack self-confidence when communicating and are more likely to suffer from depression and anxiety.

Linking self-esteem to mobile phone usage, Bianchi and Phillips (2005) identified low self-esteem as a significant predictor of problematic mobile phone use. However, it failed to predict regular and business-related use. This indicates that individuals with low self-esteem tend to become addicted to mobile phones as a means of escape. Leung (2008a) found that self-esteem was the strongest negative predictor of cell phone addiction symptoms. Among all the symptoms, self-esteem was most strongly associated with an inability to control cravings, suggesting that individuals with low self-esteem lack the self-control to resist using their mobile phones to relax and kill time. Similarly, Ehrenberg, Juckes, White, and Walsh

(2008) reported that low self-esteem also significantly predicted instant messaging (IM) addiction.

*Loneliness.* Loneliness is a type of deficiency that occurs when "a person's network of relationships is either smaller or less satisfying than the person's desires" (Peplau, Russell, & Heim, 1979, p. 55). Lonely individuals are characterized by incompetent social interactions in ongoing relationships in terms of both quantity and quality; they tend to spend less time and effort on social activities and have much smaller social circles. Previous studies on Internet addiction have indicated that, due to their unsophisticated social skills, lonely individuals tend to treat the Internet as an alternative space for communication (e.g., Caplan, 2007). By adopting mediated interpersonal communication technologies such as the Internet, lonely individuals can ease feelings of distress and anxiety. Mobile communication studies have had similar findings; for instance, Park (2005) found that loneliness is positively associated with mobile phone addiction among Korean college students, revealing that individuals tend to reduce feelings of loneliness by seeking entertainment on mobile devices.

However, inconsistent findings have emerged in recent years regarding the predictive role of loneliness for problematic mobile phone use. Takao, Takahashi, and Kitamura (2009) found that although loneliness can help identify heavy mobile phone users, it cannot predict addictive mobile phone use. In a more recent study, Park and Lee (2011) demonstrated that loneliness did not predict the compulsive usage of mobile phones. These studies suggest that since mobile phones can facilitate interaction among friends, lonely people may use their phones to connect rather than escape. Although loneliness is significantly associated with Internet and gaming addictions, it might not be associated with mobile phone

addiction, as mobile phones are ubiquitous and multifunctional devices.

*Shyness.* Shyness refers to the tendency to feel worried or tense during social interactions. Cheek and Buss (1981) defined shyness as "one's reaction to being with strangers or casual acquaintances including tension, concern, feelings of awkwardness and discomfort, and both gaze aversion and inhibition of normally expected social behavior" (p. 330). Shyness might prevent individuals from establishing new friendships, even if they are desired. Parrott (2000) found that shy individuals regarded their social networks as less supportive and less satisfying than individuals who were not shy.

Previous research has indicated that mediated communication technologies offer an invisible shield that protects shy individuals during social interactions. For example, Carducci and Zimbardo (1995) found that computer-mediated media provide shy individuals with a more comfortable environment for controlling the communication process, as it is asynchronous and often text-based (e.g., e-mail and instant messaging). However, though digital media provide a safe environment for communicating, shyness has been found to be significantly correlated to addictive media use. For example, Caplan (2002) identified that shyness, similar to depression, loneliness, and self-esteem, was a significant predictor of problematic Internet use. Mobile phones, which are portable, offer shy people more opportunities to avoid face-to-face communication, especially through nonverbal functions such as texting or social networking (Hall & Baym, 2012). Furthermore, shy people might be more likely to use mobile computing (such as gaming and video watching) to escape from uncomfortable social situations or boredom.

In contrast, other studies have shown that shyness was negatively associated with mobile phone use (Wei & Lo, 2006), which may indicate that shy people's withdrawal with

regard to communication can limit even their virtual social interactions. In addition, since

shyness is commonly related to introversion, a question is raised: Are extraverts immune to

problematic media use due to their openness to communication? The answer is not

necessarily affirmative; Bianchi and Phillips (2005) found that extraversion was significantly

related to problematic mobile phone use. This could be due to the fact that extraverts are

more likely to seek sensations and risks.

*Leisure boredom.* Leisure boredom is a consequence of an individual's perception of

having too much time and too little to do. In fact, Phillips (1993) suggested that having an

abundance of time is central to feelings of boredom; boredom occurs when people sense

that their leisure activities are not challenging enough, when they have to face meaningless

routines and obligations, or when they feel that they do not possess the skills to make use

of their leisure time. Previous studies have indicated that leisure boredom is a critical

predictor of problematic behaviors and is significantly associated with substance abuse,

risky sex, gambling, dropping out of school, and delinquency.

Past studies on leisure boredom found it to be closely linked with symptoms of media

addiction. It has also been suggested that leisure boredom is a key motivator for computer

and Internet use, which may occur when individuals, especially adolescents, cannot find

satisfactory recreational activities in offline settings. Lin, Lin, and Wu (2009) discovered that

leisure boredom and leisure activities increase the likelihood of Internet addiction.

Extending this line of inquiry, Leung (2008a, 2008b) and Bian and Leung (2014) found that

leisure boredom had a significant effect on mobile phone addiction.

*Self-control*. Studies have indicated that students who use media problematically

usually suffer from poor academic performance, and that procrastination, which leads to

poor performance at school and work, might be related to the constant distraction of information technologies; it has been shown that adult Internet addicts are less efficient at work. Davis, Flett, and Besser (2002a) argued that people might use procrastination via the Internet as a strategy for coping with stress. In a later study, Davis et al. (2002b) showed that procrastination was significantly linked with distraction, one of the negative consequences of problematic Internet use. Nalwa and Anand (2003) found that individuals who lack self-control and good time management skills postpone their work because they spend too much time online. Similarly, Thatcher, Wretschko, and Fisher (2008) discovered that procrastination was one of the strongest predictors of problematic Internet use for information technology workers in South Africa. This may be due to the fact that the accessibility of mobile phones allows for the instant and constant availability of the Internet and entertainment, exacerbating the risk of distraction for mobile phone addicts.

## LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

The definition of and criteria for assessing addictive media use have been continuously debated. For example, Griffiths (2008) pointed out problems with criteria proposed by several scholars, including a lack of a method for measuring severity and the temporal dimension, overestimation of the prevalence of problematic use, and ignorance of the context of technology use. These criticisms urge current researchers to adopt more stringent standards in the field, particularly to prevent exaggeration of the prevalence of addictive mobile phone use. Special attention should be given to distinguishing addictive users from heavy or habitual users. Bianchi and Phillips (2005) showed that heavy mobile phone users are generally young extraverts, whereas mobile phone addicts, while likely

young and extraverted, have low self-esteem. Thus, future research must adopt more rigorous standards and formulate effective criteria for differentiating mobile phone addicts from non-addicts.

Since most studies on mobile phone addiction have been based on cross-sectional surveys, they are unable to offer causal explanations. Experimental designs provide more stringent criteria for determining specific addictive symptoms and causes, and longitudinal studies can yield important findings about the conditions under which mobile phone addiction is developed, especially in adolescents. These studies are much needed because they will offer parents and educators valuable prevention strategies, especially for children and adolescents.

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**INDEX WORDS**

mobile phone addiction; impulse control disorder; problematic mobile phone use; smartphone; technological addiction; behavioral addiction; addiction symptoms; addiction assessments

**KEY TERMS AND DEFINITIONS**

**Smartphone**: A mobile phone with more advanced functions including web browsing,

GPS navigation, personal digital assistant, a media player, a digital camera, a motion sensor

for interactive games, a touch screen, Wi-Fi, and 3rd-party apps.

**Mobile phone addiction**: A compulsive (or impulsive) usage of the mobile phone.

**Technological addiction**: A compulsive (or impulsive) usage of a technology.

**Behavioral addiction**: An impulse control disorder involving non-chemical

human-machine interaction.

**Addiction symptoms**: A maladaptive pattern of substance use, leading to significant

psychological impairment and is manifested by symptoms such as withdrawal, tolerance,

preoccupation, and loss of control over the substance.

**Addiction assessment:** Diagnostic criteria for screening addictive smartphone use.