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## Excessive smartphone use and addiction: When harms start outweighing benefits

*Excessive smartphone use can become a serious problem for some individuals and should be investigated within and outside the addiction framework, with careful consideration of the balance between positive and negative effects of use, as well as the individual dynamics over time.*

The increase in smartphone use parallels increasing concerns regarding the potential negative impact of excessive use on a range of outcomes in areas such as mental health, performance at work or school and interpersonal relationships. 'Smartphone addiction' is often used in everyday language and in popular communication outlets as well as in peer-reviewed research on excessive smartphone use, together with conclusions on factors predicting 'smartphone addiction' and its consequences. Many previous studies are based upon suboptimal methodologies [1], and prevalence estimations will remain error-prone without a proper definition of the underlying psychopathology, deeming the term 'addiction' currently premature.

A complicating factor in the discussion concerning whether excessive smartphone use can become an addiction is that the device contains a plethora of applications (apps), some of which are designed to be used frequently, if not excessively. Excessive smartphone use is a broad term covering both passive use (content scrolling) and active use (interacting with others) [2, 3]. Excessive smartphone use is related to consequences and negative outcomes such as emotional distress and dysfunction. Reflecting on this, it might make sense to differentiate excessive smartphone use from habitual use. Rapid content checking can become extremely habitual for some, without it necessarily becoming problematic. Comparing smartphone use to smoking and alcohol use, the high availability of our smartphones may make it easier to develop habitual and excessive patterns of use. Like smoking, where addiction (tobacco use disorder) becomes more prevalent after the introduction of an easy-to-use portable device (cigarette), the smartphone may escalate problematic use of specific internet apps. Moreover, while excessive use and addiction can both be viewed as automatized behavior, that does not necessarily make it an addiction. Addiction has been conceptualized as an extreme form of habit by some [4], but this notion has not been strongly supported by the evidence in recent reviews, which concluded that addiction is better conceptualized as excessive goal-directed behavior [5]. Comparing excessive smartphone use to alcohol, a substance used by many individuals, alcohol use has potential health consequences for

users at all levels, but approximately 10% of users develop an alcohol use disorder. The important question then is: what would make it an addiction in the case of smartphone use?

New technologies and media multi-tasking have been related to negative outcomes such as digital stress [6], inattention [7] and isolation [8]. Excessive smartphone use has been linked to traffic accidents [9, 10], mental health problems such as depression and sleep quality [11], and may have negative developmental implications for youth [11]. These studies are an important first step, but there is also critique related to the methodology used, such as a lack of longitudinal studies and examination of between-participant correlations with static assumptions that do not take context and within-participant dynamics of use into account [12, 13]. Unlike the currently recognized addiction disorders, there are many positive aspects of smartphone use in daily life, facilitating communication, social interaction and entertainment [14]. A great challenge lies in the complexity, contextuality and dynamical balance between positive and negative aspects of smartphone use.

There are currently no official diagnostic criteria for excessive smartphone use as a behavioral addiction in either the DSM-5 or the ICD-11. Previous studies suggest that excessive smartphone users can experience withdrawal, tolerance and loss of control [15]. An argument against placing excessive smartphone use in an addiction diagnostic framework would be that almost all daily users occasionally experience some of these symptoms due to the all-day availability and necessity to use our smartphones, but the positive consequences may still outweigh the negative. The high prevalence estimates of smartphone 'addiction' when the DSM-5 or ICD substance use disorder symptoms are used (e.g. 12.5–26.6%) [15, 16] also suggest that the addiction framework may lead to over-pathologizing. However, one could argue that there are cases of excessive smartphone use with strong negative consequences, such as someone knowing that using a smartphone in a car is dangerous but still doing it, and thereby causing a traffic accident. It is highly likely that some specific functions and features of applications may be more addictive than others. However, we would not want to imply that smartphone addiction exists at this point in time. The right studies have not yet been conducted to draw or reject this conclusion. Conceptualizing the smartphone as a catalyst for the availability of digitality can contribute to our understanding of digital balance and wellbeing, especially by also focusing upon clinical subgroups. The wide spectrum of possibilities and interactions makes smartphone use complex to investigate and comparable to the discussions about internet 'addiction'; excessive smartphone use is an

overarching concept where individuals can have more problems with some functions than others [17, 18]. The ways in which the device is used may also differ between age groups [11]. Therefore, as researchers, we should be more nuanced and take into account the individual differences and (digital) complexity [19].

## IMPLICATIONS FOR RESEARCH

Because using a smartphone is common, high scores on frequency of use are normal. If the frequency of use is high, and individuals interact with many people on a daily basis (especially in youth), the chance that someone will experience negative psychosocial consequences is also high. Research that moves beyond measuring frequency of use and the presence of any addiction-like symptom and focus upon those excessive users that experience serious recurring problems in everyday life is crucial. What are the effects of certain patterns of smartphone use, why, and for whom? Understanding those processes can help us to provide a benchmark for developing a proper definition of excessive smartphone use within or outside the addiction framework. The ultimate goal is to promote a more sensible and healthy way of using the smartphone.

We should also pay attention to the positive aspects of smartphone use next to the identification of a potentially addictive profiles [13]. It is essential to know more about the impact of digital technologies on how to live a beneficial life in today's society and how we can balance dynamic mobile connectivity with face-to-face social contacts and wellbeing [20]. Smartphones are clearly here to stay, and excessive use can be problematic for some: that is why we have to examine it.

## KEYWORDS

Addiction, behavioral health, digital wellbeing, excessive smartphone use, individual differences, mental health

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## DECLARATION OF INTERESTS


None.

## AUTHOR CONTRIBUTIONS

**Helle Larsen:** Conceptualization; writing original draft; writing review & editing. **Reinout Wiers:** Conceptualization; writing review & editing. **Shuang Su:** Conceptualization; writing review & editing. **Janna Cousijn:** Conceptualization; writing review & editing.

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