



# Impacts of Smartphone Dependence on Students' Sleep and Everyday Memory

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## ABSTRACT

This commentary deliberates the impact of smartphone dependence on students sleep and everyday memory. Prior studies and descriptive statistical analysis have helped to analyze the habitual use of smartphone and examine how prebedtime exposure to smartphones may affect their sleep quality and memory among students.

**Keywords:** Habitual smartphone use; Sleep quality; Memory; Social cognitive theory; Students; Dependence

## Commentary

Smartphone dependence refers to a physical dependence on presence of mobile devices. It's a global commonplace that more and more people become smartphone users, especially students. According to the latest 47th "Statistical Report on the Development of China's Internetwork", conducted by China Internet Network Information Center (CNNIC), there are approximately 986 million mobile networks users. 16.6% of users are under 19 years old [1]. For school related tasks, constant connectivity, or entertainment, smartphones are increasingly used by teenagers. This age group is vulnerable to problematic smartphone use for less self-control ability. The development of smartphones implies that the risk of smartphone dependence may be more prominent [2]. Health related behaviors, emotional disorders, and sleep quality can be impacted by smartphone dependence.

However, Chinese students in elementary, middle, and high schools, exhibit slight smartphone dependence. That is, Chinese students have habitual smartphone use but not smartphone addiction, although they are proficient in using smartphones [3]. It echoed findings in South Korea, indicating that smartphone users admitted dependence but denied addiction [4]. Besides, there are gender and age differences in Chinese students' smartphone dependence. Boys present higher levels of smartphone dependence than girls. Older students show higher smartphone dependence as well.

Duration and frequency of smartphone use might be two key predictors of students' smartphone dependence in China. By measuring "how long" and "how often" respectively, we can get a comprehensive understanding of relationship between smartphone use and smartphone dependence [5]. As media dependency theory (MDT) stated, media use impacted individual behaviors. More media use results in more smartphone dependence. But it is not enough to consider smartphone use only. Social cognitive theory (MCT) prompts us to take personal cognition as a crucial predictor. Self-efficacy is regarded as a main cognitive force for behaviors. When students present higher levels of smartphone self-efficacy, they show stronger smartphone dependence. Therefore, smartphone self-efficacy is a valid cognitive predictor of smartphone dependence [3].

Sleep quality problems and sleep disorders are bad consequences of smartphone dependence. Students show poor sleep

quality when they are more dependent on smartphones [6]. A nationally representative survey of Chinese students helps us better comprehend the cross cultural differences.

Worse everyday memory is another negative effect of smartphone dependence [7]. Students with higher smartphone dependence recall more daily memory failures in the past. They need to check whether they have done something that they should have done. While the smartphone makes our life more convenient, it also occupies a lot of our time and energy. We use smartphones to seek information, pursue entertainment, and contact with others instantly in daily life. Frequent use of smartphones distracts our attention to remember something. As the impact of smartphone dependence, sleep quality can further affect everyday memory. Worse memory associate with worse sleep quality, which implies a complex process from smartphone dependence to health related development. Association between students' media dependence and health deserves more profound research.

Scholars from different disciplines, such as psychology and communication, argue that prebedtime exposure disrupts adolescents' sleep quality [8]. A study from China indicated that prebedtime exposure worked as a moderator of students' smartphone dependence and sleep quality. Higher prebedtime exposure increased smartphone dependence, leading to poorer sleep quality. With increasingly heavy school works in the daytime, prebedtime use of smartphone in students become more and more common. This general smartphone habit gives us sound reasons to focus on students' prebedtime use of smartphone and its health related effects.

Synthesizing smartphone use time, use frequency, and self-efficacy as predictors, sleep quality and everyday memory as effects, prebedtime exposure as a moderator, an integrated model sheds light on future research in smartphone dependence of

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students. A series of past studies focus on developed countries, while less attention is paid to developing countries, such as China. A nationally representative survey of Chinese students uncovered the relationship between smartphone dependence and sleep as well as every memory [3]. Findings from Chinese students confirmed smartphone dependence instead of smartphone addiction.

## Conclusion

Findings in smartphone self-efficacy enlighten us to alleviate this problem in an effective way. That is, conduct digital literacy education for school aged students. Meanwhile, taking everyday memory and pre-bedtime exposure into account, we comprehensively understand the impacts of smartphone dependence. Given the adverse effects of smartphone dependence, it is crucial for parents and educators to regulate overuse of smartphone in students. To broaden theoretical knowledge and practical implementation of students' smartphone dependence, more cross cultural and longitudinal studies are needed.

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## Biographical Note

Xiaojing Li is a professor and the Vice President of the School of Media and Communication at Shanghai Jiao Tong University in China. Her research focused on media uses and effects, new media and children, especially interested in the role of new media played in developing countries. Xiangping Tan is a graduate student of the School of Media and Communication at Shanghai Jiao Tong University. Her research focused on new media use and effects, esp. among adolescents.

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## Declaration of Conflicting Interests

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