INFORMATION SYSTEMS EDUCATION JOURNAL

Volume 23, No. 5
September 2025
ISSN: 1545-679X

In this issue:

4. ***Invited Paper***
Treating problematic smartphone usage in the TikTok era: cultural dimension bias in the current research
David Firth, University of Montana
Tyler Johnson, University of Montana
Shawn F. Clouse, University of Montana
Patricia Akello, University of Montana

20. **Blockchain Education: Evaluating Programs, Curricula, and Integration with Emerging Technologies in Higher Education**
Tan Gürpinar, Quinnipiac University
Aashman Verma, Quinnipiac University
Lori N. K. Leonard, The University of Tulsa
Kiku Jones, Quinnipiac University
Wendy Ceccucci, Quinnipiac University

30. **Exploring VR-Enhanced Learning in Business Education: A Multi-Site Study**
Kevin Mentzer, Nichols College of Business
Mark Frydenberg, Bentley University
Suhong Li, Bryant University

44. **Assessing the Impact of Prerequisite Courses on Student Performance in Database Normalization**
Kevin Slonka, Saint Francis University
Matthew North, Utah Valley University
Neelima Bhatnagar, University of Pittsburgh
Anthony Serapiglia, Saint Vincent College

53. ***Teaching Case***
Countering the "Plagiarism Slot Machine": Protecting Creators and Businesses from AI Copyright Infringement
Christine Ladwig, Southeast Missouri State University
Dana Schwieger, Southeast Missouri State University
Reshmi Mitra, Southeast Missouri State University

iscap
Information Systems & Computing Academic Professionals

The **Information Systems Education Journal** (ISEDJ) is a double-blind peer-reviewed academic journal published by **ISCAP** (Information Systems and Computing Academic Professionals). Publishing frequency is five times per year. The first year of publication was 2003.

ISEDJ is published online (https://isedj.org). Our sister publication, the Proceedings of the ISCAP Conference (https://iscap.us/proceedings) features all papers, abstracts, panels, workshops, and presentations from the conference.

The journal acceptance review process involves a minimum of three double-blind peer reviews, where both the reviewer is not aware of the identities of the authors and the authors are not aware of the identities of the reviewers. The initial reviews happen before the ISCAP conference. All papers, whether award-winners or not, are invited to resubmit for journal consideration after applying feedback from the Conference presentation. Award winning papers are assured of a publication slot; however, all re-submitted papers including award winners are subjected to a second round of three blind peer reviews to improve quality and make final accept/reject decisions. Those papers that are deemed of sufficient quality are accepted for publication in the ISEDJ journal. Currently the target acceptance rate for the journal is under 35%.

Information Systems Education Journal is pleased to be listed in the Cabell's Directory of Publishing Opportunities in Educational Technology and Library Science, in both the electronic and printed editions. Questions should be addressed to the editor at editor@isedj.org or the publisher at publisher@isedj.org. Special thanks to volunteer members of ISCAP who perform the editorial and review processes for ISEDJ.

2025 ISCAP Board of Directors

Amy Connolly James Madison University President	Michael Smith Georgia Institute of Technology Vice President	Jeff Cummings Univ of NC Wilmington Past President
David Firth University of Montana Director	Mark Frydenberg Bentley University Director/Secretary	David Gomillion Texas A&M University Director
Leigh Mutchler James Madison University Director	RJ Podeschi Millikin University Director/Treasurer	Jeffry Babb West Texas A&M University Director/Curricular Matters
Eric Breimer Siena College Director/2024 Conf Chair	Tom Janicki Univ of NC Wilmington Director/Meeting Planner	Xihui "Paul" Zhang University of North Alabama Director/JISE Editor

Copyright © 2025 by Information Systems and Computing Academic Professionals (ISCAP). Permission to make digital or hard copies of all or part of this journal for personal or classroom use is granted without fee provided that the copies are not made or distributed for profit or commercial use. All copies must bear this notice and full citation. Permission from the Editor is required to post to servers, redistribute to lists, or utilize in a for-profit or commercial use. Permission requests should be sent to Paul Witman, Editor, editor@isedj.org.

INFORMATION SYSTEMS EDUCATION JOURNAL

Editors

Paul Witman
Editor
California Lutheran University

Thomas Janicki
Publisher
U of North Carolina Wilmington

Dana Schwieger
Associate Editor
Southeast Missouri State University

Kevin Mentzer
Associate Editor
Nichols College

Ira Goldstein
Teaching Cases & Exercises Co-Editor
Siena College

Michelle Louch
Teaching Cases & Exercises Co-Editor
Duquesne University

Donald Colton
Emeritus Editor
Brigham Young University Hawaii

Jeffry Babb
Emeritus Editor
West Texas A&M University

Treating problematic smartphone usage in the TikTok era: cultural dimension bias in the current research

David Firth
david.firth@umontana.edu

Tyler Johnson
tyler.johnson1999@gmail.com

Shawn F. Clouse
shawn.clouse@umontana.edu

Patricia Akello
patricia.akello@umontana.edu

University of Montana
Missoula, MT 59812

Abstract

As smartphone ownership has steadily increased there has been a rise in individuals that display Problematic Smartphone Use (PSU). Through a comprehensive literature review of PSU it quickly became evident that research into PSU intervention strategies such as Cognitive Behavior Therapy (CBT) and Digital Detox are focused on "collectivist cultures". However, "collectivist cultures", such as India and China, account for only 45% of the world's population, and omit North America, almost all of Europe, Africa and Australasia. Further, our literature review identified that PSU intervention strategies almost all focus on issues surrounding social media use and gaming. Beyond this over-focus on collectivist cultures, we also find that the advent of TikTok has fundamentally changed things. TikTok has a strategy of using AI to feed users short form video (SFV) content that they find interesting. This is a very different form of smartphone usage than before TikTok, and almost certainly leads to a different form of PSU. As such, it is not clear that CBT and Digital Detox strategies developed based on "collectivist cultures" and based on pre-TikTok consumption of social media and gaming is relevant or effective Using a grounded theory approach, this paper is the first to identify the issue of a tilt in the PSU literature and the accompanying CBT and Digital Detox strategies to "collectivist cultures", as well as the first to recognize the impact on these PSU treatments as a result of the "TikTok Era" and the resulting transition to SFV. The outcome is that a rethink and new research into PSU and accompanying treatments is needed.

Keywords: problematic smartphone use, cognitive behavioral therapy, digital detox, short form video, TikTok

Recommended Citation: Firth, D., Johnson, T., Clouse, S.F., Akello, P., (2025). Treating problematic smartphone usage in the TikTok era: cultural dimension bias in the current research. *Information Systems Education Journal* v23, n5, pp 4-19. DOI# https://doi.org/10.62273/RQWN6726.

Treating problematic smartphone usage in the TikTok era: cultural dimension bias in the current research

David Firth, Tyler Johnson, Shawn F. Clouse, Patricia Akello

1. INTRODUCTION

With the steady increase of smartphone ownership and accessibility, Problematic Smartphone Use (PSU) is becoming more apparent within society (Auxier & Anderson, 2021). PSU can be defined as compulsive smartphone use that can lead to negative consequences during daily functioning in terms of productivity, social relationships, physical health, or emotional well-being (Horwood & Anglim, 2018). Interventions can be made in several ways to help remedy PSU, including the use of apps designed for the purpose, not using the smartphone at all, which is called Digital Detox (Baek, 2013), as well as techniques such as cognitive behavioral therapy (CBT). CBT is an individual therapy that is designed to identify and make changes to an individual's negative behaviors, and has been found to be promising in helping the habits that PSU may cause (Kim, 2013).

This paper begins with a basic review of the current state of research on PSU, and ways in which individuals might cope with PSU. From this initial review phase, we discovered two trends which are the core thesis of this paper: that current research on how PSU can be treated with CBT and Digital Detox may be missing important issues of culture that make such research less relevant across areas of the world beyond those most intensely covered in the literature; that current research on how PSU can be treated with CBT and Digital Detox is focused almost exclusively on traditional forms of social media, and gaming, which ignores the rapid and intensive shift to short form video (SFV) being the predominate way smartphone users spend their time online, exemplified by the rise of TikTok. As a result, the research on how to treat PSU needs a rethink or new research regarding PSU and accompanying treatments.

2. RESEARCH BACKGROUND

Problematic Smartphone Usage

Problematic Smartphone Usage (PSU) is a term that can group certain individuals into a specific category correlated to the way they use their smartphone and can manifest in different ways depending on the user. PSU can be seen in behaviors such as using the device while driving which has been correlated to increase in traffic collisions and has been investigated as early as 1992 through data on mobile phone distractions related to collisions while driving (Billieux et al., 2019; Sun & Jia, 2016; Violanti, 1998).

Dependency problems can impact smartphone users that rely on the device to achieve their desired goals (Li, 2017) and may influence certain social, behavioral, and affective (mood) problems and can be linked to addictive behavior amongst individuals (Chóliz, 2010; Csibi et al., 2018). Although PSU is linked to addictive behavior there has yet to be a standard cut off point to distinguish if an individual user is addicted or has reached a problematic level of use (Harris et al., 2020). Even though there is no standard cutoff to diagnose PSU, someone who may be exhibiting PSU can be identified as displaying the six core components of addictive behavior. These are salience, mood modification, tolerance, withdrawal symptoms, conflict, and relapse (Csibi et al., 2018). Table 1 below describes each of these terms in more detail in relation to problematic and addictive behavior towards smartphones.

Term	Definition
Salience	Overwhelming dominance and total preoccupation of smartphone use.
Mood Modification	Mood changes experienced directly using smartphones.
Tolerance	The increase over time of daily hours spent using smartphones.
Withdrawal Symptoms	Negative feelings when unable to engage in smartphone use.
Conflict	Intrapersonal and interpersonal problems arising from smartphone use.
Relapse	The reversion to addictive smartphone behavior after a period of abstinence.

Table 1: Definition Table, Source, Csibi et al., (2017)

The most significant predictors of PSU are time spent using the device, conscientiousness (wanting to fulfill your own duties), emotional stability, openness, and age (Griffiths et al., 2017). Specific app use by an individual, which means the individual is focused on a particular app, for example Facebook or TikTok, may be another indicator to PSU or smartphone addiction (Noë et al., 2019).

Even though there is limited research that addresses general prevalence of PSU within individuals as a whole or who is likely to be affected by problematic use, preschool children and young adults are at highest risk for smartphone related addicted behavior (Csibi et al., 2019). The most vulnerable age group for excessive smartphone use are adolescents between the ages of 14 to 18 years old (Csibi et al., 2019; Lemola et al., 2015). A data analysis of problematic use within populations of children and young people shows that one in four of the individuals included in the study exhibited PSU, and with these behaviors they also have greater odds of being in poorer mental health than someone that does not suffer from PSU (Sohn et al., 2019). Another survey found that about a third of UK adults surveyed said that they find it difficult to disconnect (OfCom, 2016). Pew Research center also found that almost half of U.S. adults reported that they "could not live" without their smartphone (Elhai et al., 2016; Smith, 2015).

Early studies on PSU show the potential correlations to anxiety disorders, personality disorders, depressive disorders, and excessive stress when problematic use is present in an individual (Griffiths et al., 2017; Sohn et al., 2019), and more time spent on smartphones can lead to increase in anxiety (Griffiths et al., 2017). Results from research on anxiety and computers found anxiety was most related to PSU and that when one's smartphone usage increases their depression decreases and vice versa (Elhai et al., 2016). The inverse relationship of depression with smartphone use was a pattern found in many studies displaying the dependency of an individual when PSU is present and it can be further described as an individual's perceived depression increasing when they are unable to use their smartphone (Elhai et al., 2016). Younger individuals are at the highest risk of problems developing from PSU with many of the symptoms in these populations consisting of depression, anxiety, high levels of perceived stress, and poor sleep (Sohn et al., 2019). Social interactions are also impacted by the prevalence of PSU, envy was a risk factor mediated from fear of missing out that is created through PSU use in adolescent individuals. Envy in this circumstance is when the individual is jealous of what they see other people experiencing through their device (Wang et al., 2019).

Although there is limited research on which smartphone apps are causing problematic use or are the most addictive, social media apps like Snapchat show their correlation to PSU (Noë et al., 2019). Based on an indicator called Smartphone Application Based Addiction Scale (SABAS), which uses the six core components of addiction as discussed earlier as measurement, excessive users of social media apps and gaming are more likely to develop addiction symptoms than individuals that use their smartphones for productive tasks such as school or work purposes (Csibi et al., 2019).

Coping With Problematic Smartphone Use (PSU)

With PSU impacting certain individuals in the digital era, how to cope with it is an important topic. Research on coping with PSU is extensive, and within it we found two mechanisms that are more prevalent: 1) remedies such as Cognitive Behavioral Therapy (CBT), which is an individual therapy that is designed to identify and make changes to an individual's negative behaviors and may be an effective way of coping with PSU (Kim, 2013), and 2) apps designed specifically to intervene during long periods of smartphone use, which is called Digital Detox (Baek, 2013).

CBT "is a common type of talk therapy (psychotherapy). You work with a mental health counselor (psychotherapist or therapist) in a structured way, attending a limited number of sessions. CBT helps you become aware of inaccurate or negative thinking so you can view challenging situations more clearly and respond to them in a more effective way" (Mayo Clinic, 2019). CBT may be effective in dealing with PSU use as it has been found to help a multitude of habits. For instance, it can assist a person with an internet addiction to recognize the thoughts and feelings that are leading to their addictive behavior (Kim, 2013; Orzack & Orzack, 1999). In another study analyzing the impact of mind-body exercise (defined in this setting as gentle movement, anatomic alignment, mental focus, deep breathing, and staying in a meditative present state) and CBT, it was found that both to be useful in combating PSU as well as promoting good overall mental health (Thomas et al., 2020). In a controlled study completed on a group of individuals ages 12-19 that used an adapted form of CBT to target excessive smartphone use, the

individuals showed a reduction in their excessive smartphone use after the therapy as well as an improvement in their psychological well-being (Khalily et al., 2021). This improvement in psychological well-being included a significant decrease in symptoms of depression, anxiety, stress, hyperactivity, and emotional difficulties immediately following the trial and this decrease maintained during the 3-month follow-up. In this case, excessive smartphone use follows a similar meaning to PSU as defined earlier correlating with the same impacts for each including increased risk of depression and anxiety, higher perceived stress, and poorer sleep in these individuals with these excessive or problematic behaviors (Horwood & Anglim, 2018; Khalily et al., 2021; Sohn et al., 2019). CBT has been found to be effective in treating individuals that exhibit these psychological issues and could be a gateway into helping change the habits of problematic smartphone users (Kim, 2013).

With the large potential effect on the youth since younger individuals are more likely to become problematic smartphone users', other intervention techniques are worth discussing (Sohn et al., 2019). Digital interventions, which are smartphone apps that are created to help reduce smartphone usage, could be promising if they become popular enough (van Velthoven et al., 2018). One study focused on the impact of an app that was created to show an individual their usage statistics and ways to limit their usage behaviors with a goal of self-regulation of smartphone use shows the efficacy of such an app. The results show that individuals using this app had a significant decrease in usage as well as their ability to manage interruptions was greatly improved (Ko, Yang, et al., 2015). However, there is a lack of empirical evidence that proves the safety and effectiveness of digital interventions through smartphone apps (van Velthoven et al., 2018). Due to individual subjective differences to their use (varying experiences produced by different users) the effectiveness of an application is difficult to find because of the inability to tailor the application to each person's specific psychological needs (van Velthoven et al., 2018).

Another approach that is being examined to help with addictive behaviors that are caused by smartphone use and other internet technology is a Digital Detox, which can be defined as a periodic disconnection from social or online media, or strategies to reduce digital media involvement (Syvertsen & Enli, 2020). The apps described earlier for digital interventions can be viewed in a similar way to digital detox because of their goal to reduce digital media in a user (Ko, Choi, et al., 2015; Syvertsen & Enli, 2020; van Velthoven et al., 2018). A study completed on digital detox, which in this case was four sessions of 24-hour smartphone abstinence, shows that there is a slight improvement in mood during periods of abstinence, but the overall results displays that there was not much change in behavior in heavy smartphone users (Wilcockson et al., 2019). Another study showed digital detox can lead to a decrease in smartphone usage and a decrease in depression symptoms after completing the intervention (Radtke et al., 2022). Though more studies are starting to be done on impacts of digital detox on PSU it is still rather a grey area and results appear to display a lack of effectiveness on the behaviors of the problematic users that are subjected through a digital detox intervention (Radtke et al., 2022; Wilcockson et al., 2019).

Studies on Coping with PSU are predominately focused on a small cross-section of global populations

In our review of studies on coping with PSU we noticed that the majority of the research was focused on a small cross-section of global populations. This is not a criticism of the research in and of itself. We are confident that the published research is thorough, informative, useful and interesting. Our point here is that there are known differences between the ways populations use and process cultural values and practices, and there is support in the literature for the fact that this has an impact on the efficacy of remedies such as Cognitive Behavioral Therapy (CBT). Although we conducted a thorough search, we were not able to locate studies about cross-cultural or cross-country similarities or differences for apps designed specifically to intervene during long periods of smartphone use (Digital Detox).

This is classic grounded theory approach to conducting research. Grounded theory is a qualitative research methodology that aims at the generation of theory from the literature, treating the body of existing studies as the data. Charmaz's (2006) constructivist perspective emphasizes the co-construction of meaning between the researcher and the data. When applied in the context of a literature review, grounded theory reconceptualizes the body of existing studies as data, facilitating the emergence of novel theoretical insights (Breckenridge & Jones, 2009; Mills et al., 2006; Tie et al., 2019). Unlike deductive approaches that test pre-established hypotheses, grounded theory employs an inductive process where data

collection and analysis occur simultaneously (Charmaz, 2006; Glaser & Strauss, 2017). This iterative approach allows researchers to identify patterns, themes, and relationships within the literature, enabling the development of theory directly informed by the reviewed studies (Breckenridge & Jones, 2009; Charmaz, 2006; Mills et al., 2006). In the context of a literature review, grounded theory serves as both a methodological foundation and an analytical tool, an approach for exploring dynamic or complex phenomena, especially where existing theoretical frameworks may fall short in capturing emerging dynamics (Charmaz, 2006; Glaser & Strauss, 2017; Mills et al., 2006). Grounded theory has been employed in numerous studies in the field of Information Systems to address evolving phenomena.

Building off our grounded theory insight, we are first going to introduce two theories for looking at the ways different cultures might interact differently with CBT and Digital Detox: Hofstede's Cultural Dimensions Theory and the Theory of Cognitive Styles.

Hofstede's *Cultural Dimensions Theory* (Hofstede, 1984) is a framework for cross-cultural communication that shows the effects of a society's culture on the values of its members, and how these values relate to behavior. As CBT and Digital Detox are behavioral interventions, we believe that it is likely that the use of these as an intervention for PSU is likely going to vary across countries and cultures.

Witkin's *Theory of Cognitive Styles* (Witkin et al., 1977) "is a person's preferred way of gathering, processing, and evaluating information. It influences how people scan their environment for information, how they organize and interpret this information, and how they integrate their interpretations into the mental model and subjective theories that guide their actions" (Hayes & Allinson, 1998). As with Hofstede's Cultural Dimensions Theory, we believe that since CBT and Digital Detox are behavioral interventions, different cognitive styles across cultures and countries may impact the efficacy of these interventions.

In order to validate our contention that the majority of research on PSU with interventions of CBT and Digital Detox is focused on a small cross-section of global populations, we use a recent narrative review on combatting digital addiction and the countermeasures proposed (Cemiloglu et al., 2022) which reviews papers on this topic over the period 2012 to 2022. In addition, the Cemiloglu, et al. (2022) review finds that six scales have been used to screen research participants for mobile phone or smartphone addiction (see Appendix A for the six scales).
The Cemiloglu, et al. (2022) review cites 17 papers that use CBT as a PSU countermeasure approach. These papers are included in Table 2, along with the location of the study covered by the research, and whether or not one of the six screening for mobile or smartphone addiction scales was used.

Excluding the one paper that is a review paper of the literature, CBT as a countermeasure approach to digital addiction was studied 4 times in China (25%), 3 times in South Korea (18.75%), 3 times in Germany (18.75%), and once each in Spain, Pakistan, Iran, Austria and the USA (6.25%) (note, one study covered Germany and Austria, so the total adds up to more than 100%). When the list is narrowed to those studies where the research participants were selected based on mobile or smartphone addiction surveys, there are 4 in total, with 2 from South Korea, 1 from China and 1 from Pakistan.

The Cemiloglu, et al. (2022) review cites nine papers that use Digital Detox in the form of limit setting as a countermeasure approach. These papers are included in Table 3, along with the location of the study cover by the research, and whether or not one of the six screening for mobile or smartphone addiction scales was used.

Excluding the one paper that used downloads from the Google Play store for data (and therefore did not report country of the participant), Digital Detox from limit setting as a form of digital addiction countermeasure was the location of the study four times (50%) in South Korea, and one time in each of Japan, India and the USA (33%), with one study being across the world though predominately from Asia.

We next map the locations where the research was conducted with CBT or Digital Detox countermeasures onto the Hofstede's Cultural Dimensions (Hofstede, 1984) framework. We have combined countries, such as Austria - Germany, and China – South Korea – Japan, where the three Hofstede dimensions of Individualism – Collectivism, Power Distance and Uncertainty Avoidance are the same. The intent here is to show whether or not there are concentrations of research around specific types of cultural dimensions.

In Table 4, we summarize three dimensions of Hofstede's Cultural Dimensions Theory (Hofstede,

1984) showing the effects of a society's culture on the values of its members, and how these values relate to behavior. The dimensions are Individualism-Collectivism, Power Distance, Uncertainty Avoidance. We map these to the relevant research on CBT or Digital Detox countermeasures.

In the US, there is a high level of individualism, leading to a focus on Personal achievement, Independence, and Self-expression. This can manifest itself as regards to CBT as being something that is acceptable, and indeed easy to talk about, as therapy is about Independence, and Self-expression. In contrast, countries such as China, South Korea and Japan have a much more collectivist approach to culture with a focus on the values of its members, and how these values relate to behavior, leading to a focus on group consensus, social harmony and interdependence. This suggests that CBT and Digital Detox might be more problematic as a choice of intervention in higher collectivism societies than higher individualistic societies.

We note that there is support in the literature for this contention. For instance, "there are persistent questions about the generalizability of CBTs to culturally diverse populations and whether culturally sensitive approaches are warranted" (Huey et al., 2023). This very recent research also notes that there is "a dearth of relevant trials" of the impact of cultural sensitivity within the context of CBT.

Reference number in Cemiloglu, et al. (2022)	Citation	Location of study	Participants screened based on mobile or smartphone addiction surveys?
[13]	Hou, Y., Xiong, D., Jiang, T., Song, L., & Wang, Q. (2019).	Social psychology course at Peking University, **China**	No
[28]	Alavi, S. S., Ghanizadeh, M., Mohammadi, M. R., Jannatifard, F., Esmaili Alamuti, S., & Farahani, M. (2021).	All students at Tehran, **Iran** universities in the academic year of 2018-19	No
[42]	Li, T., Cui, L., Ma, S., Zhang, S., Zheng, J., Xiao, J., & Zhang, Q. (2018).	Forty-two **Chinese** college students	Yes
[60]	Wölfling, K., Müller, K. W., Dreier, M., Ruckes, C., Deuster, O., Batra, A., & Beutel, M. E. (2019).	4 outpatient clinics in **Germany** and **Austria**	No
[61]	Seo, H. S., Jeong, E. K., Choi, S., Kwon, Y., Park, H. J., & Kim, I. (2020).	**Korea** University Ansan hospital between the ages of 10 and 24 year	Yes
[72]	Ke, G. N., & Wong, S. F. (2018).	**Malaysia**	No
[73]	Han, J., Seo, Y., Hwang, H., Kim, S. M., & Han, D. H. (2020).	**South Korea**	No
[74]	Wölfling, K., Beutel, M. E., Dreier, M., & Müller, K. W. (2014).	42 patients in **Germany**	No
[75]	González-Bueso, V., Santamaría, J. J., Fernández, D., Merino, L., Montero, E., Jiménez-Murcia, S., & Ribas, J. (2018).	Barcelona, **Spain**	No
[84]	Zhang, J. T., Ma, S. S., Li, C. S. R., Liu, L., Xia, C. C., Lan, J., & Fang, X. Y. (2018).	Beijing Normal University, **China**	No
[86]	Young, K. S. (2013). Treatment outcomes using CBT-IA with Internet-addicted patients. *Journal of behavioral addictions*, *2*(4), 209-215.	**USA**	No
[105]	Du, Y. S., Jiang, W., & Vance, A. (2010).	**China**	No
[106]	Lee, H., Seo, M. J., & Choi, T. Y. (2016).	**South Korea**	Yes
[107]	Kim, S., & Noh, D. (2019).	5 in **China** 3 in **Korea** 2 in **USA** 1 in **Germany** Survey of prior research	No
[108]	Khalily, M. T., Bhatti, M. M., Ahmad, I., Saleem, T., Hallahan, B., Ali, S. A. E. Z., & Hussain, B. (2021).	**Pakistan**	Yes
[109]	Szász-Janocha, C., Vonderlin, E., & Lindenberg, K. (2021).	**Germany**	No

Table 2: 17 papers extracted from Cemiloglu, et al. (2022) review that use CBT as a PSU countermeasure approach.

Reference number in Cemiloglu, et al. (2022)	Citation	Location of study	Participants screened based on mobile or smartphone addiction surveys?
[117]	Ko, M., Yang, S., Lee, J., Heizmann, C., Jeong, J., Lee, U., & Chung, K. M. (2015)	Google Play – smartphone intervention apps	N/A
[118]	Ko, M., Choi, S., Yatani, K., & Lee, U. (2016)	**South Korea**	No
[119]	Kim, I., Jung, G., Jung, H., Ko, M., & Lee, U. (2017)	**South Korea**	No
[120]	Löchtefeld, M., Böhmer, M., & Ganev, L. (2013)	**Asia** (53.5%), **North America** (16.5%) and **Europe** (14.5%)	No
[121]	Kim, J., Cho, C., & Lee, U. (2017).	**South Korea**	No
[122]	Yasudomi, K., Hamamura, T., Honjo, M., Yoneyama, A., & Uchida, M. (2021).	**Japan**	No
[123]	Hiniker, A., Hong, S., Kohno, T., & Kientz, J. A. (2016).	**USA**	No
[124]	Okeke, F., Sobolev, M., Dell, N., & Estrin, D. (2018)	**India**	No
[129]	Ko, M., Choi, S., Yang, S., Lee, J., & Lee, U. (2015).	**South Korea**	No

Table 3: 9 papers extracted from Cemiloglu, et al. (2022) review that use Digital Detox in the form of limit setting as a countermeasure approach.

We recognize that the Cemiloglu (2022) paper, which forms the core of our ground theory analysis, is from 2022. To address this, we performed a comprehensive review of the PSU literature since then. We found that Olson et al. (2023) conducted "A nudge-based intervention to reduce problematic smartphone use", which is a Digital Detox intervention. This was conducted in Canada, a Highly Individualistic society.

As a cross-check, we also mapped the relevant research on CBT and Digital Detox using Witkin's Theory of Cognitive Styles (Witkin et al., 1977). This theory integrates a person's interpretations into the mental model and subjective theories that guide their actions, and there is clearly overlap between Hofstede's Cultural Dimensions Theory (Hofstede, 1984) and Witkin's Theory of Cognitive Styles (Witkin et al., 1977). We do not present the results here as they provide the same country-based distribution of relevant research on CBT and Digital Detox as the Hofstede's Cultural Dimensions Theory in Table 4.

Location	Papers identified in Table 1 & 2	Hofstede's Cultural Dimension of Individualism / Collectivism	Hofstede's Cultural Dimension of Power Distance	Hofstede's Cultural Dimension of Uncertainty Avoidance
USA	1 CBT 1 Digital Detox	**Highly Individualistic** Prioritize: Personal achievement Independence Self-expression	**Low** Great emphasis on: Equality Independence Challenging authority	**Low** Greater emphasis on: Innovation, flexibility and adaptability
Austria Germany	1 CBT 3 CBT	**Moderately individualistic** Prioritize: Personal achievement Independence Self-expression	**Low** Great emphasis on: Equality Independence Challenging authority	**Moderate to High** Strong emphasis on: Tradition Rules Avoiding risk
Spain	1 CBT	**Moderately collectivistic** culture, with a strong emphasis on family, community, and social harmony	**Relatively high** power distance culture, with a strong respect for authority and hierarchy	**Relatively high** uncertainty avoidance culture, with a strong desire for structure and rules
Malaysia	1 CBT	**More collectivistic** Prioritize: Social Harmony Interdependence, Group consensus	**High** Strong emphasis on: Respecting authority Social Status Hierarchy	**Moderate to High** Strong emphasis on: Tradition Rules Avoiding risk
India Pakistan	1 Digital Detox 1 CBT	**More collectivistic** Prioritize: Social Harmony Interdependence, Family loyalty	**High** Strong emphasis on: Respecting authority Social Status Hierarchy	**High** Strong emphasis on: Regulations Rules Avoiding risk
China South Korea Japan	4 CBT 3 CBT 4 Digital Detox 1 Digital Detox	**More collectivistic** Prioritize: Social Harmony Interdependence, Family loyalty	**High** Strong emphasis on: Respecting authority Social Status Hierarchy	**High** Strong emphasis on: Tradition Rules Avoiding risk

Table 4: Mapping the relevant research (Cemiloglu et al., 2022) on CBT or Digital Detox countermeasures against the main three dimensions of Hofstede's Cultural Dimensions Theory

	Individualism/Collectivism	Power Distance	Uncertainty Avoidance	CBT / Digital Detox papers
USA	Highly individualistic	Low	Low	2
Austria / Germany	Moderately Individualistic	Low	Moderate	4
Spain	Moderately Collectivistic	Relatively High	Relatively high	1
Malaysia	More Collectivistic	High	Moderate	1
India / Pakistan	More Collectivistic	High	High	2
China/South Korea/Japan	More Collectivistic	High	High	12
				22

Table 5: Mapping the relevant research (Cemiloglu, et al., (2022) – 22 papers) on CBT or Digital Detox countermeasures against the main three dimensions of Hofstede's Cultural Dimensions Theory

Table 5 shows that 16 out of 22 (73%) papers on treating PSU with CBT and Digital Detox were in high to moderately highly collectivist societies. This leaves us to conclude that there is support for our theory that current research on CBT and Digital Detox may be missing important issues of culture that make such research less relevant across areas of the world beyond those most intensely covered in the literature.

3. DISCUSSION

TikTok Time: Studies on Coping with PSU are predominately focused on traditional Social Media

In addition to the fact that many studies on PSU and coping with PSU through CBT and Digital Detox are country-specific and largely in countries with a more collectivistic cultural outlook which prioritizes Social Harmony, Interdependence, and Family loyalty, in our review of studies on coping with PSU we noticed that the majority of the research was focused on the use and interaction with traditional social media (Twitter, Facebook, Snapchat, Instagram) on PSU on smartphones. This makes sense as much of this research was conducted in an era when social media (Twitter, Facebook, Snapchat, Instagram) accounted for significant monthly active users, and for significant growth. Chart 1 shows the month active users and associated growth for Twitter, Facebook, Snapchat, and Instagram from 2013 to 2023. We note that use of YouTube, a video sharing platform, had a steady increase in monthly active users over this period, whereas Facebook and Snapchat are plateauing in their monthly active users, which suggests a move in users away from social interaction on traditional social media platforms, to videos for entertainment.

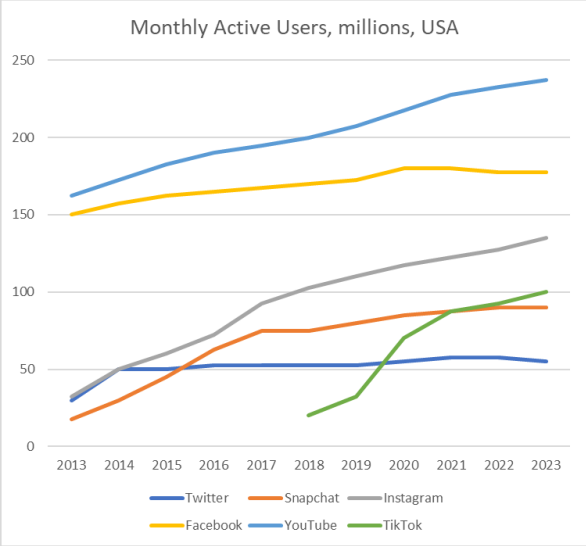


Chart 1: Data sourced from The Economist, 2023

Possibly more important than users when it comes to PSU, though, is the time spent per day on a smartphone with a particular app. Chart 2 maps out time spent per day, in minutes, on TikTok, Instagram, Snapchat and Facebook. As the chart shows, time spent with TikTok far exceeds Facebook, Snapchat and Instagram, and is almost the same as Snapchat and Instagram combined. Facebook use is trending down, Snapchat and Instagram is level, and TikTok use is growing from ~12 minutes per day in 2019 to ~60 minutes per day in 2023, a 5-fold increase.

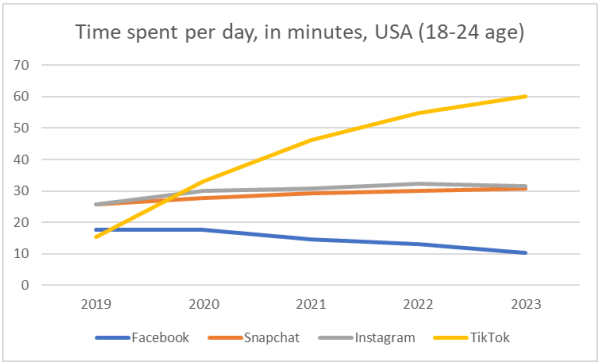


Chart 2: Data sourced from The Economist, 2023

As a cross-check, we conducted an informal survey of 50 students in our Management Information Systems classes at the 200- and 400-level (with median age of 20.2 in the 200-level class and 21.6 in the 400-level class). We had students report the data by checking their "Digital Wellbeing" in their Android device or "Screen On Time with a specific focus on apps" for iPhones.

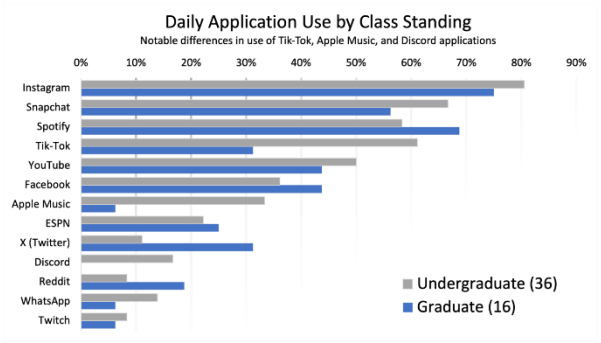


Chart 3: Daily app use by undergraduate class standing

In addition, we asked a follow-up question about the specific use of Instagram: "Are you watching videos or looking at photos?" Almost 80% of students reported that their main use of Instagram was to watch videos. This is important as it highlights a major change in the way people, specifically students in this case, are engaging

with the apps on their smartphones. In the past it was for traditional social media, for which the main purpose was for social connection, and the main mental health issue was *fear of missing out (FOMO)* (Amran & Jamaluddin, 2022). The rise of TikTok and YouTube (Chart 1) and more importantly the rise in time spent on TikTok and YouTube (Chart 2) has changed how people engaged with their smartphones. There has been a move away from social networking, and instead to entertainment. The fact that Spotify, an app focused exclusively on music, is the number two most used app for our students (Chart 3) confirms that apps-for-entertainment is a big part of how people engage with their smartphones today.

According to TikTok itself, TikTok isn't a traditional social media platform: "The audiences that love and build and create and connect with TikTok, they say they check Facebook, and they check Instagram and they check Twitter and they check Snap and they check things. But they don't check TikTok. They tell us they watch TikTok" (Honigman, 2022). What we are seeing is that TikTok is more of an entertainment platform, where the entertainment is delivered via short form video. Facebook has recognized this change in user behavior from connecting socially to wanting to be entertained. In response to TikTok, Facebook introduce Reels "as its answer to the explosively popular short-video app TikTok" (Culliford, 2022). They note in 2022 that "Reels is already our fastest growing content format by far" and that "video now accounts for half of the time people spend on Facebook" (Culliford, 2022). We feel that this means that we need to look at PSU interventions around "entertainment" on smartphones as opposed to use of traditional social media on smartphones.

Coping with PSU as a result of short form video use

In addition to research about the use and abuse of social media on smartphones, there is a good deal of research around gaming on smartphones. For example, in a narrative review on approaches to combat digital addiction, the majority of studies delivered countermeasures for Internet Gaming Disorder (Cemiloglu et al., 2022). However, we posit that gaming is very different to the short form videos (SFV) that provide entertainment which form the core of what TikTok delivers. Gaming is typically interactive (Baker et al., 2021). Watching short form videos, in contrast, is a passive, receptive activity.

Research on short form video is extremely limited. This makes sense as one could argue that TikTok defined the short form video format, and TikTok only became globally available in August 2018 (Wikipedia "TikTok," 2025). We found zero articles using the following Google Scholar search term: "using cognitive behavioral therapy as an intervention for short form video addiction". Even searching for just "Short form video" yielded very few results, a confirmation that this entertainment format is a new phenomenon.

One such study looked at "the association between perceived stress and SVA [short form video] addiction, as well as its mechanism—the mediating role of self-compensation motivation (SCM) and the moderating role of shyness" (Liu et al., 2021). This does not address smartphone addiction in particular (short form videos can be watched on many platforms including TV and laptop), but we do note that it was conducted on a "total of 896 Chinese college students", furthering our findings that much of the research in this area is specific to a county with a collectivist cultural dimension.

Another study addressing short form video looked at how the "information system environment affects users' internal states of enjoyment, concentration, and time distortion (which scholars define as the flow experience)" (Qin et al., 2022). This study finds that "TikTok addiction is determined by users' mental concentration on the medium and its content" but does not address the use of CBT or Digital Detox. We note again that the study was conducted on "659 adolescents in China aged between 10 and 19 years old".

In a study exploring stress and problematic use of Short-Form Video Applications (Huang et al., 2022) showed that stress was positively associated with problematic SVAs use. The paper did not suggest intervention strategies, and was conducted on 194 middle-aged adults from China.

Liu et al. (2021) examined perceived stress and short-form video application addiction and found that perceived stress was positively associated with SVA. They note that their research could provide suggestions for relevant prevention and intervention procedures, but do not cover this aspect. The study was conducted on a "total of 896 Chinese college students".

Finally, Zhang et al. (2019) looked at what factors affected addition to short form video apps. They found that "social interaction anxiety and social isolation were … positive influences on short-form video app addiction". There was no discussion of possible treatments such as CBT or Digital Detox,

and we once again note that the study was conducted on users of TikTok in China.

With short form videos as provided by TikTok, and also by Instagram, YouTube Shorts and Facebook Reels, being a passive, receptive activity, we liken them closest to TV. TikToks, YouTube Shorts, Facebook Reels and Instagram videos, whose most common length is 26 seconds, according to Instagram (Adobe, n.d.) are, in effect, just short television shows.

Accordingly, we posit that addressing smartphone addiction in the era of TikTok should commence with a review of the scholarly work on TV addiction. As a gauge of this line of research, we looked at Google Trends for "TV addiction". Google Trends starts from Jan 1, 2004 only (Chart 4). The peak at that time likely is an artifact of how the data is aggregated, that is, we do not believe that there was a massive spike in Google searches for "TV addiction" in January 2004, but rather all pre-January 2004 data is aggregated to January 2004. What the trend chart does show is that there has been little to no real activity in this space for almost 2 decades.

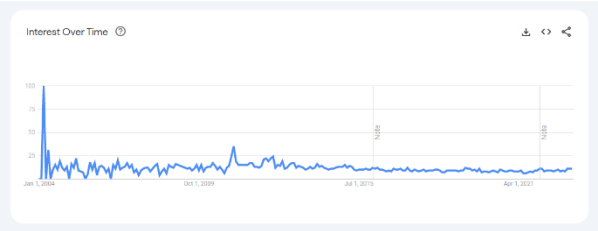


Chart 4: Google searches for "TV addiction" since 2004

We are confident that television addiction falls in the same realm as short-form video addiction, as it is measured with the distinct components of heavy viewing, problem viewing, and craving for viewing (Horvath, 2004). With this as a starting point, we then explored the literature for how to treat TV addiction, with the notion that such treatments could be translated into the short-form video addiction arena.

A seminal piece by Sussman & Moran (2013) "provide[s] a review of the definition, etiology, prevention and treatment of the apparent phenomenon of television addiction." Relevant to PSU and short-form video addiction, the authors found that "counseling that attempts to facilitate a secure attachment style with others may help delimit reliance on television as a form of passive social contact", and also that "mood management techniques might be instructed to reduce the desire to search out external sources of relief such as the TV". Both of these suggestions are elements of CBT and thus provide an indication that CBT might be an appropriate intervention for PSU and short-form video addiction.

A 2004 article by two of the pioneers of research on television addiction (Kubey & Csikszentmihalyi, 2004) noted that interventions for such included "promoting alternative activities" and "exercising willpower". They also noted digital detox interventions such as "enforcing limits" and "blocking channels/V-chip" use. A 1991 article noted, briefly, that "researchers are often asked how to break the television habit", and noted that there are few empirical studies for comparing methods for reducing excessive television viewing, but there are number of published accounts "based on common sense or generalizations from self-control techniques to gaining control over other habits" (McIlwraith et al., 1991).

5. CONCLUSIONS

The original purpose of this review was to show what Problematic Smartphone Use is, who it impacts, and ways in which it impacts individuals, with a focus on job and academic performance. During our review we pivoted to a grounded theory approach, and found that there were two issues at play with the extant research. Firstly, the vast majority of papers on treating PSU with CBT and Digital Detox were performed on subjects in collectivist (Hofstede, 1984) countries: China, India, Pakistan, Japan, Indonesia. The literature already suggests that "there are persistent questions about the generalizability of CBTs to culturally diverse populations and whether culturally sensitive approaches are warranted" (Huey et al., 2023). Combining our first finding with these "persistent questions" suggests that the current research on PSU and treating it with CBT and Digital Detox is far too myopic in scope, and needs to be broadened to populations that have high individualistic natures, such as the USA, western Europe, Africa, and Australasia.

Secondly, we realized that the vast majority of papers on PSU and treating it with CBT and Digital Detox were looking at issues related to traditional social media use and gaming as the cause of PSU. We have labelled this the pre-TikTok era, as the arrival of TikTok in August 2018 has led to a fundamental change in how people use their smartphones. Watching short form videos is a passive, consumptive activity, very different from engaging in social media dialogue. As such, we believe that interventions such as CBT and Digital

Detox, and their efficacy, need to be studied anew in the TikTok era.

In sum, this paper is a call to future research action around these two findings.

5. REFERENCES

Adobe. (n.d.). *Editing Videos for Instagram for Free | Adobe Express*. Retrieved February 7, 2025, from https://www.adobe.com/express/create/video/instagram

Amran, M. S., & Jamaluddin, K. A. (2022). Adolescent Screen Time Associated with Risk Factor of Fear of Missing Out During Pandemic COVID-19. *Cyberpsychology, Behavior, and Social Networking*, *25*(6), 398–403. https://doi.org/10.1089/cyber.2021.0308

Auxier, B., & Anderson, M. (2021). Social media use in 2021. *Pew Research Center*, *1*(1), 1–4.

Baek, R. (2013, July 5). At Tech-Free Camps, People Pay Hundreds To Unplug. *NPR*. https://www.npr.org/sections/alltechconsidered/2013/07/05/198402213/at-tech-free-camps-people-pay-hundreds-to-unplug

Baker, J. M., Bruno, J. L., Piccirilli, A., Gundran, A., Harbott, L. K., Sirkin, D. M., Marzelli, M., Hosseini, S. M. H., & Reiss, A. L. (2021). Evaluation of smartphone interactions on drivers' brain function and vehicle control in an immersive simulated environment. *Scientific Reports*, *11*(1), 1998. https://doi.org/10.1038/s41598-021-81208-5

Billieux, J., Flayelle, M., Rumpf, H.-J., & Stein, D. J. (2019). High Involvement Versus Pathological Involvement in Video Games: A Crucial Distinction for Ensuring the Validity and Utility of Gaming Disorder. *Current Addiction Reports*, *6*(3), 323–330. https://doi.org/10.1007/s40429-019-00259-x

Breckenridge, J., & Jones, D. (2009). Demystifying theoretical sampling in grounded theory research. *Grounded Theory Review*, *8*(2). https://www.researchgate.net/profile/Helen-Scott-11/publication/285789198_Data_Analysis_Getting_conceptual/links/5c09154792851c39ebd7719a/Data-Analysis-Getting-conceptual.pdf#page=64

Cemiloglu, D., Almourad, M. B., McAlaney, J., & Ali, R. (2022). Combatting digital addiction: Current approaches and future directions. *Technology in Society*, *68*, 101832. https://doi.org/10.1016/j.techsoc.2021.101832

Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. sage. https://books.google.com/books?hl=en&lr=&id=2ThdBAAAQBAJ&oi=fnd&pg=PP1&dq=Charmaz,+K.+(2006).+Constructing+grounded+theory:+A+practical+guide+through+qualitative+analysis&ots=f-l_3LpECY&sig=WpItiXO_mB3zOmEH660dHtFsTrM

Chóliz, M. (2010). MOBILE PHONE ADDICTION: A POINT OF ISSUE. *Addiction*, *105*(2), 373–374. https://doi.org/10.1111/j.1360-0443.2009.02854.x

Csibi, S., Griffiths, M. D., Cook, B., Demetrovics, Z., & Szabo, A. (2018). The Psychometric Properties of the Smartphone Application-Based Addiction Scale (SABAS). *International Journal of Mental Health and Addiction*, *16*(2), 393–403. https://doi.org/10.1007/s11469-017-9787-2

Csibi, S., Griffiths, M. D., Demetrovics, Z., & Szabo, A. (2019). Analysis of Problematic Smartphone Use Across Different Age Groups within the 'Components Model of Addiction.' *International Journal of Mental Health and Addiction*, *19*(3), 616–631. https://doi.org/10.1007/s11469-019-00095-0

Culliford, E. (2022, February 22). Facebook launches Reels globally, betting on "fastest growing" format. *Reuters*. https://www.reuters.com/technology/facebook-launches-reels-globally-betting-fastest-growing-format-2022-02-22/

Elhai, J. D., Levine, J. C., Dvorak, R. D., & Hall, B. J. (2016). Fear of missing out, need for touch, anxiety and depression are related to problematic smartphone use. *Computers in Human Behavior*, *63*, 509–516. https://doi.org/10.1016/j.chb.2016.05.079

Glaser, B., & Strauss, A. (2017). *Discovery of grounded theory: Strategies for qualitative research*. Routledge. https://www.taylorfrancis.com/books/mono/10.4324/9780203793206/discovery-grounded-theory-barney-glaser-anselm-strauss

Griffiths, M. D., Kuss, D. J., Lopez-Fernandez, O., & Pontes, H. M. (2017). Problematic gaming

exists and is an example of disordered gaming: Commentary on: Scholars' open debate paper on the World Health Organization ICD-11 Gaming Disorder proposal (Aarseth et al.). *Journal of Behavioral Addictions*, *6*(3), 296–301. https://doi.org/10.1556/2006.6.2017.037

Harris, B., Regan, T., Schueler, J., & Fields, S. A. (2020). Problematic Mobile Phone and Smartphone Use Scales: A Systematic Review. *Frontiers in Psychology*, *11*. https://doi.org/10.3389/fpsyg.2020.00672

Hayes, J., & Allinson, C. W. (1998). Cognitive Style and the Theory and Practice of Individual and Collective Learning in Organizations. *Human Relations*, *51*(7), 847–871. https://doi.org/10.1023/A:1016978926688

Hofstede, G. (1984). *Culture's consequences: International differences in work-related values* (Vol. 5). sage. https://books.google.com/books?hl=en&lr=&id=Cayp_Um4O9gC&oi=fnd&pg=PA13&dq=Culture%27s+Consequences:+International+Differences+in+Work-Related+Values+(2nd+ed.)&ots=V6EHAAPLP6&sig=UOgPCgjnNJElITi1YTSyclDdB0E

Honigman, B. (2022). TikTok isn'ta social media platform, according to TikTok. *Fast Company. Https://Www. Fastcompany. Com/90746981/Tiktok-Social-Video*.

Horvath, C. W. (2004). Measuring Television Addiction. *Journal of Broadcasting & Electronic Media*, *48*(3), 378–398. https://doi.org/10.1207/s15506878jobem4803_3

Horwood, S., & Anglim, J. (2018). Personality and problematic smartphone use: A facet-level analysis using the Five Factor Model and HEXACO frameworks. *Computers in Human Behavior*, *85*, 349–359. https://doi.org/10.1016/j.chb.2018.04.013

Huang, Y., Finsterwalder, J., Chen, N. (Chris), & Crawford, F. R. L. (2022). Online student engagement and place attachment to campus in the new service marketplace: An exploratory study. *Journal of Services Marketing*, *36*(4), 597–611. https://doi.org/10.1108/JSM-04-2021-0148

Huey, S. J., Park, A. L., Galán, C. A., & Wang, C. X. (2023). Culturally Responsive Cognitive Behavioral Therapy for Ethnically Diverse Populations. *Annual Review of Clinical Psychology*, *19*(Volume 19, 2023), 51–78. https://doi.org/10.1146/annurev-clinpsy-080921-072750

Khalily, M. T., Bhatti, M. M., Ahmad, I., Saleem, T., Hallahan, B., Ali, S. A.-Z., Khan, A. A., & Hussain, B. (2021). Indigenously adapted cognitive–behavioral therapy for excessive smartphone use (IACBT-ESU): A randomized controlled trial. *Psychology of Addictive Behaviors*, *35*(1), 93–101. https://doi.org/10.1037/adb0000677

Kim, H. (2013). Exercise rehabilitation for smartphone addiction. *Journal of Exercise Rehabilitation*, *9*(6), 500–505. https://doi.org/10.12965/jer.130080

Ko, M., Choi, S., Yang, S., Lee, J., & Lee, U. (2015). FamiLync: Facilitating participatory parental mediation of adolescents' smartphone use. *Proceedings of the 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing*, 867–878. https://doi.org/10.1145/2750858.2804283

Ko, M., Yang, S., Lee, J., Heizmann, C., Jeong, J., Lee, U., Shin, D., Yatani, K., Song, J., & Chung, K.-M. (2015). NUGU: A Group-based Intervention App for Improving Self-Regulation of Limiting Smartphone Use. *Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing*, 1235–1245. https://doi.org/10.1145/2675133.2675244

Kubey, R., & Csikszentmihalyi, M. (2004). Television Addiction. *Scientific American Mind*, *14*(1), 48–55.

Lemola, S., Perkinson-Gloor, N., Brand, S., Dewald-Kaufmann, J. F., & Grob, A. (2015). Adolescents' Electronic Media Use at Night, Sleep Disturbance, and Depressive Symptoms in the Smartphone Age. *Journal of Youth and Adolescence*, *44*(2), 405–418. https://doi.org/10.1007/s10964-014-0176-x

Li, L. (2017). *Work-related smartphone dependency among young working adults in urban China: An examination of the dependency relations, antecedents, and consequences* [Thesis]. https://doi.org/10.32657/10356/69610

Liu, Y., Ni, X., & Niu, G. (2021). Perceived Stress and Short-Form Video Application Addiction: A Moderated Mediation Model. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.747656

Mayo Clinic. (2019). *Cognitive behavioral therapy—Mayo Clinic*. https://www.mayoclinic.org/tests-procedures/cognitive-behavioral-therapy/about/pac-20384610

McIlwraith, R., Jacobvitz, R. S., Kubey, R., & Alexander, A. (1991). Television Addiction: Theories and Data Behind the Ubiquitous Metaphor. *American Behavioral Scientist*, *35*(2), 104–121. https://doi.org/10.1177/0002764291035002003

Mills, J., Bonner, A., & Francis, K. (2006). The Development of Constructivist Grounded Theory. *International Journal of Qualitative Methods*, *5*(1), 25–35. https://doi.org/10.1177/160940690600500103

Noë, B., Turner, L. D., Linden, D. E. J., Allen, S. M., Winkens, B., & Whitaker, R. M. (2019). Identifying Indicators of Smartphone Addiction Through User-App Interaction. *Computers in Human Behavior*, *99*, 56–65. https://doi.org/10.1016/j.chb.2019.04.023

OfCom, U. K. (2016). Children and parents: Media use and attitudes report. *London: Office of Communications London*.

Olson, J. A., Sandra, D. A., Chmoulevitch, D., Raz, A., & Veissière, S. P. L. (2023). A Nudge-Based Intervention to Reduce Problematic Smartphone Use: Randomised Controlled Trial. *International Journal of Mental Health and Addiction*, *21*(6), 3842–3864. https://doi.org/10.1007/s11469-022-00826-w

Orzack, M. H., & Orzack, D. S. (1999). Treatment of Computer Addicts with Complex Co-Morbid Psychiatric Disorders. *CyberPsychology & Behavior*, *2*(5), 465–473. https://doi.org/10.1089/cpb.1999.2.465

Qin, Y., Omar, B., & Musetti, A. (2022). The addiction behavior of short-form video app TikTok: The information quality and system quality perspective. *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.932805

Radtke, T., Apel, T., Schenkel, K., Keller, J., & Von Lindern, E. (2022). Digital detox: An effective solution in the smartphone era? A systematic literature review. *Mobile Media & Communication*, *10*(2), 190–215. https://doi.org/10.1177/20501579211028647

Smith, A. (2015). *U.S. Smartphone Use in 2015*. https://policycommons.net/artifacts/619211/us/1600302/

Sohn, S. Y., Rees, P., Wildridge, B., Kalk, N. J., & Carter, B. (2019). Prevalence of problematic smartphone usage and associated mental health outcomes amongst children and young people: A systematic review, meta-analysis and GRADE of the evidence. *BMC Psychiatry*, *19*(1), 356. https://doi.org/10.1186/s12888-019-2350-x

Sun, D., & Jia, A. (2016). Impacts of cell phone use on driving safety and drivers' perception of risk. *Journal of Modern Transportation*, *24*(2), 145–152. https://doi.org/10.1007/s40534-016-0102-x

Sussman, S., & Moran, M. B. (2013). Hidden addiction: Television. *Journal of Behavioral Addictions*, *2*(3), 125–132. https://doi.org/10.1556/jba.2.2013.008

Syvertsen, T., & Enli, G. (2020). Digital detox: Media resistance and the promise of authenticity. *Convergence*, *26*(5–6), 1269–1283. https://doi.org/10.1177/1354856519847325

Thomas, J. J., Becker, K. R., Kuhnle, M. C., Jo, J. H., Harshman, S. G., Wons, O. B., Keshishian, A. C., Hauser, K., Breithaupt, L., Liebman, R. E., Misra, M., Wilhelm, S., Lawson, E. A., & Eddy, K. T. (2020). Cognitive-behavioral therapy for avoidant/restrictive food intake disorder: Feasibility, acceptability, and proof-of-concept for children and adolescents. *International Journal of Eating Disorders*, *53*(10), 1636–1646. https://doi.org/10.1002/eat.23355

Tie, Y. C., Birks, M., & Francis, K. (2019). *Grounded theory research: A design framework for novice researchers*. SAGE open medicine. https://figshare.utas.edu.au/ndownloader/files/40721888/1

TikTok. (2025). In *Wikipedia*. https://en.wikipedia.org/w/index.php?title=TikTok&oldid=1273992507

van Velthoven, M. H., Powell, J., & Powell, G. (2018). Problematic smartphone use: Digital approaches to an emerging public health problem. *DIGITAL HEALTH*, *4*, 2055207618759167. https://doi.org/10.1177/2055207618759167

Violanti, J. M. (1998). Cellular phones and fatal traffic collisions. *Accident Analysis & Prevention*,

30(4), 519–524. https://doi.org/10.1016/S0001-4575(97)00094-8

Wang, P., Wang, X., Nie, J., Zeng, P., Liu, K., Wang, J., Guo, J., & Lei, L. (2019). Envy and problematic smartphone use: The mediating role of FOMO and the moderating role of student-student relationship. *Personality and Individual Differences*, *146*, 136–142. https://doi.org/10.1016/j.paid.2019.04.013

Wilcockson, T. D. W., Osborne, A. M., & Ellis, D. A. (2019). Digital detox: The effect of smartphone abstinence on mood, anxiety, and craving. *Addictive Behaviors*, *99*, 106013. https://doi.org/10.1016/j.addbeh.2019.06.002

Witkin, H. A., Moore, C. A., Goodenough, D., & Cox, P. W. (1977). Field-Dependent and Field-Independent Cognitive Styles and Their Educational Implications. *Review of Educational Research*, *47*(1), 1–64. https://doi.org/10.3102/00346543047001001

Zhang, X., Wu, Y., & Liu, S. (2019). Exploring short-form video application addiction: Socio-technical and attachment perspectives. *Telematics and Informatics*, *42*, 101243. https://doi.org/10.1016/j.tele.2019.101243

Appendix A

In addition, the Cemiloglu, et al. (2022) review finds that six scales have been used to screen research participants for mobile phone or smartphone addiction: 1) Mobile Phone Addiction Index (Leung, L. 2008); 2) Smartphone Addiction Scale – short version (Kwon, M., Kim, D. J., Cho, H., & Yang, S. 2013); 3) Mobile Phone Internet Addiction Scale (Hu, D. D., Xu, Y., Ding, J. E., & Li, J. 2017); 4) Smartphone Addiction Inventory (Lin, Y. H., Pan, Y. C., Lin, S. H., & Chen, S. H. 2017); 5) Korean Smartphone Addiction Proneness Scale (Kim, D., Lee, Y., Lee, J., Nam, J. K., & Chung, Y. 2014); 6) Chinese Test of Mobile Phone Dependence (Li, T., Cui, L., Ma, S., Zhang, S., Zheng, J., Xiao, J., & Zhang, Q. 2018).