Research article

Appetite for distraction? A systematic literature review on customer smartphone distraction

Alex Taylor [a,*,1], Margurite Hook [a,2], Jamie Carlson [a,3], Siggi Gudergan [b,c,d], Tomas Falk [c]

[a] Newcastle Business School, The University of Newcastle, Newcastle City, Cnr King and Auckland Streets, Newcastle, NSW 2300, Australia
[b] College of Business, Law & Governance, James Cook University, 1 James Cook Dr, Douglas, Queensland 4811, Australia
[c] Department of Marketing, Aalto University School of Business, P.O. Box 21230, 00076 Aalto, Finland
[d] Department of Global Business and Trade, Vienna University of Economics and Business, Building D, Welthandelsplatz 1, Wien 1090, Austria

ABSTRACT

In today's society, the ubiquitous presence of personal smartphones has led to the phenomenon of, what we call, *customer smartphone distraction* (CSD). This paper introduces the concept of CSD, which occurs when an internet-connected smartphone competes for a customer's attention during a consumption goal-oriented task or behavior. Based on a three-stage research process involving a systematic literature review and an expert opinion survey with a multi-disciplinary lens to better understand this phenomenon, we develop a conceptual framework underpinned by Cognitive – Affective Personality System (CAPS) Theory that incorporates the antecedents, contingency variables, and consequences of CSD. Our findings suggest that CSD is a complex phenomenon influenced by both environmental stimuli, such as audio and visual notifications, and internal psychological states, such as boredom and anxiety, which are interdependent factors that contribute to CSD. Interestingly, the absence of environmental stimuli alone may not reduce CSD. To deal with this issue, customers need to take responsibility for their consumption behavior, while businesses, society and policy makers can assist customers through better education and design of mobile device experiences. Overall, we highlight the need for a deeper understanding of CSD and its impact on customer behavior and well-being, and outline implications to assist researchers, practitioners, policy makers and society broadly to deal with CSD.

1. Introduction

*Buzz buzz**Buzz buzz*

The morning stillness is interrupted by a droning alarm, accompanied by a steady robotic buzzing beside your head. You reach out for the bright, white light and squint through a series of emails – "24-hour sale" "Don't miss out!" "Sign up today" – then flip between three social media apps for a few minutes, still wrapped in bed sheets. News, friends, work, celebrity scandals, the stock market … Your morning routine has become so familiar, there seems no good reason to put down your phone for more than a minute at a time. As you leave the house, your smartphone kindly notifies you of

yesterday's total screen time. In between pangs of guilt, you stash the phone in your bag.

A stop at the local café sees ten minutes evaporate while scrolling Instagram. As you take a call at the traffic lights, an oncoming cyclist you did not notice suddenly swerves to avoid you. In the elevator to your office, you think "I wonder if that jacket has been restocked in my size? Better check." then use the brand's augmented reality app to "see" how different jacket styles look on you. And on it goes. Today is just like any other day. Unremarkable, yet overwhelmingly full of things that beg for your precious attention. Moments of clarity seem fleeting. Idle time is quickly filled with a myriad of apps, chats, streams, and taps. As you climb back into bed, the day ends in much the same way it began. Bright, white light. Tap, tap, tap. *Buzz Buzz*

This is your everyday reality as a modern consumer.

The capacity to allocate and sustain attention over extended periods towards a specific task, thought, or stimulus is considered desirable, yet elusive, in the digital era (Hanin, 2021). According to Wheelwright (2022), adults in the U.S. check their mobile device an average of 344 times per day, with 71% succumbing to this habit within 10 min of waking up. These emerging patterns of technology-related behavior have sparked concern among researchers, exemplified by studies on the negative consumer effects of technology (e.g. Pantano & Scarpi, 2022), as well as the concept of 'technoference' in interpersonal relationships (e.g. McDaniel & Coyne, 2016; McDaniel & Radesky, 2018). These issues have resonated with society at large, raising questions about the extent of customer smartphone distraction (CSD) (Oraison et al., 2020), which is considered an unfortunate symptom of the stimulating allure of the modern customer lifestyle.

The underlying problem is that while smartphone technology advances rapidly, human cognitive capacity remains fixed, causing the tension on which much recent distraction research is based (e.g. L. Chen et al., 2020; Hanin, 2021). Smartphone technology undoubtedly offers substantial benefits to customers; for example, in-built augmented reality (AR) functionality eases customer decision making challenges in the marketplace (Dwivedi et al., 2021). Although smartphone use has become indispensable in navigating modern life, frequent usage can also be detrimental (e.g. impacting face-to-face social interaction; Elias et al., 2021), with smartphone distraction-addiction posing a significant threat to emotional well-being (Oraison et al., 2020).

We define specifically CSD as the outcome of a situation in which an internet-connected smartphone competes for, and compromises, a customer's attentional resources during a task or behavior aimed at achieving consumption goals. CSD is distinct from similar but related constructs (e.g. 'phubbing'; Chotpitayasunondh & Douglas (2016) in that it describes the process of distraction within the provider-customer domain, as opposed to broader interpersonal interactions. While CSD encompasses cognitive and affective elements (Throuvala et al., 2020), a number of predisposing factors have been associated with related behaviors such as addictive smartphone use (e.g., Van Deursen et al., 2015) and problematic smartphone use (e.g., Busch & McCarthy, 2021). Personality traits (Billieux, 2012; Carvalho et al., 2018; Kalaitzaki et al., 2022; Marengo et al., 2020; Roberts et al., 2015), particularly susceptibility to distraction as a function of personality (Eysenck & Graydon, 1989) and the existence of an attention-distractibility trait that confers vulnerability to distraction (Berry et al., 2014; Forster & Lavie, 2016), are amongst these factors. Yet, it remains unclear how such traits predispose CSD specifically and what roles cognitive and affective elements play in this process. With this paucity of applicable research on 'the interplay between a customer's experience with technology and its associated distracting mechanisms, as triggered by their interaction with technology in varied consumption contexts' (International Journal of Information Management, 2022) and CSD especially, developing a better understanding of CSD is crucially important.

This paper synthesizes recent literature and offers a conceptual framework that draws upon the Cognitive-Affective Processing System (CAPS) theory (Mischel & Shoda, 1995) to examine how customers' have an appetite for, and subsequent susceptibility to, CSD. CAPS clarifies how traits predispose certain behaviors and the role of cognitive and affective channels in this process. It considers the specific situation or context in which behavior (e.g. CSD) occurs, outlining that behavior is not solely determined by fixed personality traits but can vary depending on the circumstances. Our review offers an important and novel understanding about the negative effects of technology at the customer interface, as it examines distraction resulting from smartphones, a technology with widespread penetration in society. We focus on the customer-smartphone relationship specifically for two main reasons: (1) the widespread adoption of smartphones globally (73% adoption rate expected by 2030, with 6.3 billion unique smartphone users; GSMA, 2023), and (2) the unique challenges that smartphones present in achieving consumption goals (e.g. shopping-unrelated use, Sciandra et al., 2019). Furthermore, we acknowledge the growing popularity of related mobile technology including wearable devices (e.g. smart watches, Broudeur et al., 2021; smart glasses, He et al., 2018) and augmented-reality enabled vehicles (e.g. Heads Up Displays, Jing et al., 2022) but exclude these from our current analysis based on the above rationale.

Smartphone consumption experiences range from simple messaging and application use to more immersive experiences such as AR to facilitate online decision making. The risk, however, is that these devices are intensely stimulating and interesting, possessing inherent subjective value to the individual (e.g. social and entertainment; Carlson et al., 2019), resulting in an inability to focus on other important consumption tasks. What arises can be considered a dependency on the part of the customer to *serve* the demands of the technology (Mick & Fournier, 1998). To stay focused, people may plan out time and space that is *free from distraction* (typically, by restricting environmental stimuli) to complete important or rewarding actions. In line with this, a current customer trend is attempting to "Control the Scroll," under which customers prioritize meaningful use of devices instead of undertaking mindless scrolling (Euromonitor, 2023).

Screen time apps such as *Space*, *Freedom*, *Digital Wellbeing*, and *Social Fever* are popular tools, offering customers a dashboard of usage statistics and "limiters" to reduce daily time spent using smartphones (Winkelman & Beaton, 2022). Availability of such tools suggests that the average customer is both *aware* of the negative consequences of CSD and *capable* of employing strategies to reduce it. Despite the well-intentioned logic of these types of CSD-minimization approaches, when put into practice, they may provide only a temporary solution. A significant stream of research has examined the effects of sensory distraction from one's immediate environment, while unpacking the impacts of smartphone usage in consumption experiences. However, this demands a more thorough investigation since smartphones also serve as a portal to vast social and informational possibilities, not bound by spatiotemporal limitations, to make consumption decisions or communicate (Dwivedi et al., 2021). Cutino and Nees (2017, p. 67) acknowledge that smartphones may induce "distraction when access is granted and anxiety when access is limited," suggesting that understanding how CSD causes direct *sensory* distraction for the customer is merely the starting point. Therefore, the current technological environment demands a broader multi-disciplinary perspective to understand CSD and its impact on the consumption experience.

The heightened use of smartphone and AR technology has led to several literature reviews focused on the application of AR technology across consumption contexts. Specifically, Bruni and Piccarozzi (2022) identified technology benefits, enablers, and challenges of emerging technologies for the retail industry such as improvements to supply chain management, while balancing security and privacy concerns; Yung and Khoo-Lattimore (2019) summarized the application of virtual reality (VR) and AR technologies in tourism research, showing that there is limited consistency in terminology and a lack of theory-based research; and Diegmann et al. (2015) identified 14 benefits of AR applications in educational contexts (e.g. increased collaborative learning and increased student satisfaction). While this research demonstrates the utility of immersive customer experiences, it provides no understanding of CSD. It is unclear what compels customers to knowingly sacrifice finite working memory resources across multiple stimuli during important tasks at the expense of goal attainment. Therefore, in light of the growing managerial and societal concern on how best to deploy these technologies, we review the literature across multiple disciplines to unpack CSD. Specifically, we seek to answer the following research questions:

1. How has CSD been conceptualized within the literature?

2. What are the antecedents, contingency variables and consequences of CSD?
3. How do the antecedents, contingency variables and consequences of CSD theoretically relate?

To address these research questions, we undertook a three-stage research approach. First, we reviewed relevant customer-related articles on CSD published in leading journals. Following a systematic literature review (SLR; Palmatier et al., 2018; Tranfield et al., 2003) applying PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (Moher et al., 2009), we synthesized key arguments discussed in this literature. To assess if the insights garnered from this literature were in alignment with the evolving perspectives held by academic experts in the field of our study, we then conducted a survey to elicit their opinions regarding our SLR insights. As a third step, we introduced the Cognitive Affective Personality System (CAPS) theory (Mischel & Shoda, 1995) as the theoretical lens to synthesize the findings from the two initial stages and to explain how some individuals are more likely to experience CSD than others owing to how they interact with a situation (i.e. interaction with a smartphone in a consumption experience) through their cognitive-affective system. Based on this theorizing, four research propositions are advanced to explain how CSD and its immediate consequences materialize. Based on these propositions, we developed a theoretical framework that identifies four categories of influence on CSD (environmental, psychological, socio-cultural, and individual characteristics).

Our novel theoretical CSD framework has important implications for researchers as well as managers and policy makers. Imposed top-down restrictions (e.g. bans on smartphone use) may be ineffective, as the effects of certain factors – such as psychological states and socio-cultural influences – are not considered. Notwithstanding the anticipated changes in behavior, enacting restrictive use policies may not produce responsible smartphone usage behaviors and may negatively impact overall customer wellbeing. Our research suggests that a more effective approach to managing CSD may be one based on supporting the customer encoding helpful information through their cognitive-affective system via responsible design of mobile apps, customer education, and socialized self-regulated smartphone use.

Overall, these insights add to several bodies of literature. First, our research on CSD complements research on (mobile) device distraction in general (e.g. Grewal et al., 2018) and its negative consequences in particular (e.g. Roberts & David, 2016; Sciandra et al., 2019) by offering the aforementioned theoretical framework that outlines how CSD and associated consequences emerge. Second, our research extends CAPS theory to the information systems and marketing literatures to theoretically underpin four overarching research propositions in a unifying framework that explains the antecedents and consequences of CSD. This theorizing expands upon extant work on multi-tasking behaviors as it conjectures how cognitive and affective processes channel predisposed traits into CSD. Especially, it suggests that individuals' traits do not by themselves determine CSD but rather stresses that their cognitive-affective system (e.g. individual characteristics) involves the encoding of a situation (i.e. socio-cultural influences) which should be considered alongside psychological states and environmental stimuli when trying to explain multi-tasking behaviors (Mischel & Shoda, 1995). Third, this study broadens the current debate on the future of digital technologies in Marketing such as AR and VR (Plangger et al., 2022) by underlining brands', companies', and organizations' responsibility for educating customers to support their encoding process on how to cope with and potentially minimize CSD and associated negative consequences.

The remainder of this paper is structured as follows. First, a concise background on distraction, and the role of mobile and AR technology is presented. Second, the methodology employed in the systematic review is detailed, followed by a summarized analysis of the literature examined, identifying factors and interrelationships associated with CSD in

the marketplace. Third, to further reinforce the presence of these identified factors and interrelationships linked to CSD, data obtained from a survey involving expert marketing professors is scrutinized. Fourth, informed by these findings, the research then draws upon CAPS theory, to establish a unifying framework and develop research propositions. The paper concludes by highlighting implications and future research directions concerning CSD that would benefit academics, practitioners, policy makers, and customers.

2. Background

2.1. Conceptual underpinnings of customer distraction

When a person is unable and/or unwilling to dedicate their attention to a primary task (stimulus), cognitive resources in working memory are divided, and eventually transferred to a secondary task (stimulus), resulting in temporary distraction. Attention, in this sense, is the individual's focusing response to a stimulus or task that reflects a state of arousal or concentration, involving mental operations on incoming information; distraction is characterized by a lack of such attentional resources (Nelson et al., 1993). Foundational conceptualizations describe distraction as an information processing inhibitor, consistent with cognitive response models of persuasion. Early work on distraction primarily draws from the *distraction hypothesis*, which explains that while receiving a persuasive message, the introduction of a distracting stimulus will affect a customer's acceptance of that message either positively or negatively, depending on whether they were originally in agreeance with the message (Festinger & Maccoby, 1964).

The focal process in this conceptualization is that, while distracted, the customer devotes less cognitive resources to the production of either *pro* or *counter*-argumentation, thus reducing the persuasive power of the communication (see also Petty et al., 1976). To illustrate this point, when a distracting stimulus is presented during the reception of persuasive communications, this restricts an individual's capacity to produce sub-vocal counter-argumentation toward the incoming message (Keating & Brock, 1974; Osterhouse & Brock, 1970). Lammers (1982) showed that, when a dominant cognitive response is formed toward a focal subject, distraction serves to strengthen that position. In line with distraction conflict theory (Baron et al., 1973), these findings suggest that experiencing distraction tends to energize pre-existing biases, in both pro- and counter-argumentative situations.

In an advertising context, Nelson et al. (1985) failed to replicate the distraction hypothesis found in previous studies when participants were exposed to distractions while receiving a radio advertisement. Several explanations were offered for this, including whether the distraction stimulus was below a minimum threshold to sufficiently cause interruption. Nelson et al., (1985, p. 61), further identified the artificiality of distraction manipulations in the literature as a methodological concern, advocating for more "realistic" distraction stimuli. Many early studies on distraction adopt similar contexts and methodological approaches (e. g. Baron et al., 1973; Petty et al., 1976) due to the limited exposure to external stimuli in the home, school, or workplace at that time compared with the present day. In parallel with technology evolution, distraction research is now commonly associated with, and attributed to, internet-connected personal devices as it is widely acknowledged that "consumers depend so much on their mobile devices for information and engagement through the day that they become distracted from reality" (Grewal et al., 2018, p. 102).

Prior to the widespread adoption of mobile devices, McFarlane (1999) established a taxonomy consisting of four types of interruption that human–computer interaction produces: immediate (computer requires immediate user response), negotiated (user can decide to respond), mediated (an intelligent system decides on the timing), and scheduled (regular timing at pre-specified times). Computer interruptions may cause negative effects on attention; however, a negotiated interruption results in greater accuracy toward a continuous

primary task (McFarlane, 1999). Other factors also affect the level of interruption intensity, such as the nature of the interruption and its complexity (Gillie & Broadbent, 1989); where an interrupting task is similar to the primary task, or the complexity of the interrupting task is higher, then the task will be more of a strain on cognitive capacity and thus more distracting. Interruptions from media during the time of these studies (pre-2000 s) were more infrequent than in the current era, given devices were not portable. Currently, devices are used seamlessly in everyday activities, increasing preference for multi-tasking behaviors and CSD.

2.2. Multi-tasking

Multi-tasking typically refers to either simultaneous completion of two or more tasks, or rapid switching between tasks (L. Deng, 2020). Social norms coupled with digital technologies in contexts such as higher education and professional workplaces have increased multi-tasking behavior (Cutino & Nees, 2017). Mobile devices are used for a range of tasks, so primary task disruption is heightened due to multi-tasking behaviors, as identified by Gillie and Broadbent (1989) and McFarlane (1999).

Interest in the phenomenon of distraction has been paralleled and motivated by technology advancement and adoption, as potential sources of distraction have become increasingly prevalent, stimulating, and accessible. Rising fatalities from distracted drivers motivated further research in the early 2000 s, yet methodological concerns and inconsistent definitions were identified (Young et al., 2007). In the context of education, a review found that CSD in the classroom is aligned to three distraction aspects – source (e.g. sensory phone alerts), target (e. g. reading), and subject (e.g. personality and gender) (Q. Chen & Yan, 2016) – paving the way for examining a broader range of contributing factors rather than isolating individual elements. Although CSD is part of daily life, its root causes and effects are not well understood, or managed, by customers whose lives are heavily integrated with technology. Multi-tasking behavior can be considered a precursor to CSD, where the customer willingly takes on more than one task to improve productivity, resulting in either reduced attention allocation to both tasks or a delay in refocusing after task switching.

One explanation for this is that employing multi-tasking behaviors serves as a compensatory control for individuals in situations where perceived control is low (Han & Broniarczyk, 2021). Attempts to multi-task are driven by social and cultural expectations – despite assumptions that the individual undertakes such behavior of their own volition, there may be more subtle external forces influencing this process. The negative impacts of multi-tasking depend on the complexity and information processing demands of each task. In the context of education, multi-tasking behavior affects student experience and engagement. For students, switching between cognitively demanding activities to attend to incoming text messages on their mobile device is associated with reduced self-reported executive function. Even if a mobile device is out of sight and notifications inaudible, problematic device-checking behaviors indicate a lack of impulse control (i.e. there is a strong, subconscious urge to seek and interact with the stimulus; Hayashi & Nenstiel, 2021).

Research on CSD must now acknowledge that customers willingly and frequently expose themselves to sources of distraction, and the motivation to do so is strong and abundant. CSD transcends mere "background" interruptions; omnipresent, connected mobile devices offer an inexhaustible stream of "secondary" stimuli – a 'black hole' for customer attention. As a class of technology, mobile devices represent a significant threat to customer attention. The connected, portable, functional, and socially embedded nature of mobile experiences demand research attention as there is currently little overarching, multidisciplinary consensus on the CSD process.

2.3. Smartphones and AR technology: an overview

Smartphones, and the software applications they support, are designed to be highly absorbing, interactive, intuitive, and user-friendly (Ho & Chung, 2020). Designers of mobile experiences apply psychological concepts to maintain customer attention for sustained periods, often in pursuit of monetization in the "attention economy" (Lindström et al., 2021). Smartphones and their applications offer significant breakthroughs in improving convenience, connectivity, and communications; such benefits are highly valued in the modern marketplace. Organizations, educational institutions, academics, families, and individuals are now at a point where the role of the smartphone in daily life must be carefully evaluated. If we are to progress with the view that technology exists *in service* to our daily lives, rather than the reverse, CSD remains a concerning risk factor.

There is not yet a significant social stigma attached to smartphone use (Pivetta et al., 2019); even chronic use is often accepted by adults in social situations. CSD occurs as users develop a learned association between stimulus and reward. Mobile applications employ a variable ratio, variable interval reinforcement schedule, where both the frequency and intensity of the reward are unpredictable to the user (Cutino & Nees, 2017). Distractions of this nature affect customers beyond mere interruption. Interactive media is interrupting (audible alarms, visual notifications, haptic device vibration) but also programs motivation to pursue future behaviors relating to mobile device usage, some of which may be problematic. This results in a CSD loop, as illustrated in Fig. 1, where individuals engage with the mobile device to distract themselves from the real world or unwelcome emotional states, but where the act of using the mobile device can cause further negative outcomes (e.g. anxiety). However, increased appetite for distraction is insufficiently explained by rationalist cognitive processing theories commonly applied by researchers explaining drivers, process mechanisms, and outcomes.

Customer-facing technology advancements have led to greater appetite in the market for digitally mediated customer experiences, which stimulate and engage the human sensory system (Plangger et al., 2022). AR is one technology that attempts to profit from this desired experience. A key advantage of AR is its unique interactivity, combining the real world with a virtual overlay (Grzegorczyk et al., 2019), a feature unachievable with prior technologies. When combined with a mobile device, AR enables brands to create a vivid consumption experience that is easy to engage in, useful, and entertaining, in turn, increasing customer satisfaction and future brand usage (McLean & Wilson, 2019). Customer creativity is enabled through AR, deriving from the highly engaging experience the technology provides (Jessen et al., 2020), and proven to be effective in generating customer engagement across a variety of contexts including tourism (Chang et al., 2014), marketing (de Ruyter et al., 2020), and online service experiences (Hilken et al., 2017).

Particularly at the beginning of the customer journey, AR has been shown to be of benefit, with customers more likely to progress through to the purchase stage after using AR, as it offers a combination of utility and entertainment (Romano et al., 2021). If distraction arises from two
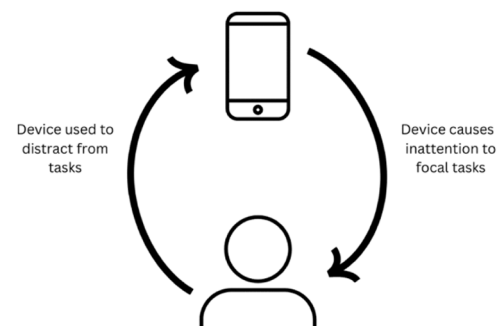

Fig. 1. CSD Loop.

competing sources of stimuli which are in a customer's sensory field, then AR has the unique potential to maintain the benefits of smartphone-enabled information but can also *integrate* the two sources of stimuli. The situation then becomes focused attention on the task or stimulus (e.g. inspecting the label on a bottle of wine), via an AR-enabled smartphone app. Rather than rapid task switching between the (a) label and (b) information displayed on the smartphone, AR allows customers to leverage the benefits of additional information on the smartphone by augmenting the label. Lombard and Ditton (1997) refer to this process as the "illusion of non-mediation", with the effect meaning two sources of stimuli merge into a single point of focus, rather than compete for attention.

However, the intended use of an AR application will likely affect the level of CSD experienced. For example, a utilitarian AR application that is highly functional and serves goal-oriented tasks is likely to have a less-distracting influence than a hedonic-based AR application, and therefore AR could be a potential solution to CSD (Arghashi, 2022). To provide an overview of the current knowledge on AR and smartphones, Supplementary Material A summarizes the SLRs focusing on AR and smartphones published to date, including the current review to show our contribution. None of these prior reviews has specifically focused on CSD.

While distraction, more generally, is a well-examined concept, scholarly literature has evolved alongside technological advancement as new sources of how media compete for attention. As new technology-based experiences are adopted, a consolidation of the literature is needed. Therefore, we apply the foundational conceptualizations of distraction and map the most recent distraction literature to provide cutting-edge insights into customers' use of smartphones.

3. Literature search and review approach

This section outlines the SLR process. SLRs represent an appropriate method when well-defined research questions are available (Petticrew & Roberts, 2006). We attempt to systematically consolidate the literature by answering the research questions proposed in Section 1. This systematic review was conducted by members of the research team and designed based upon PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (Moher et al., 2009). In applying these guidelines, the review was divided into three key stages: planning, conducting, and reporting (Kitchenham et al., 2009; Moher et al., 2009; Tranfield et al., 2003). The first two stages are described below, with the third stage (reporting of results) provided in Section 4, organized according to the two research questions.

3.1. Planning the review

Drawing from the research questions, a range of keywords were identified for the database searches, including "mobile phone," "smart phone," "augmented reality," "distraction," and "multi-tasking." In line with prior studies (Agarwal et al., 2019; Borges et al., 2021; Yan et al., 2021), Web of Science (WoS) and Scopus were identified as appropriate databases to obtain relevant and reliable journal articles across disciplines (see Table 1). To determine the eligibility of articles, inclusion and exclusion criteria were created in line with PRISMA guidelines (Massaro et al., 2016; Moher et al., 2009; Tranfield et al., 2003), see Fig. 2. Inclusion criteria included i) journal articles investigated mobile or AR technologies, and distraction or multi-tasking, involving customers (i.e., consumption context), ii) journal articles published in English, iii) journal articles published in high-ranking outlets (Scimago Q1 or Q2), iv) journal articles published since 2016 (to ensure the technology studied is up to date), v) journal articles empirical in nature, and vi) full-text versions accessible. The full exclusion criteria included i) publications merely mentioning distraction or multi-tasking, ii) publications where the focus was not on a customer-related experience, iii) publications in other than high-ranking journal articles, and iv)

Table 1
Research Methods Employed.

Research Method	Papers	Count
Survey	P1, P4*, P5, P8, P12, P13, P17, P21, P22	9
Experiment	P2, P9, P11, P14, P15, P16, P18*, P19, P20	9
Field Experiment	P6, P10*, P18*, P23	4
Observation	P3*, P7	2
Eye Tracking Experiment	P10*	1
Interviews	P3*	1
Experience Sampling	P6*	1
Phone Tracking	P4*	1
Total		**28**

* Note: Some papers employed more than one method, so the total is greater than the reviewed sample of 23.

Inclusion Criteria:
- Distraction via smartphone
- Consumption-related context
- Literature published in English language
- Publication in Q1 or Q2 Scimago-ranked journal
- Publication date since 2016
- Empirical papers (both quantitative and qualitative)
- Full text available

Exclusion Criteria:
- Publications merely mentioning distraction or multi-tasking
- Driver and pedestrian safety focused
- Study context is not consumption-related
- Publications in unranked, Q3 or Q4 Scimago-ranked journal
- Conceptual Papers (non-empirical)
- Literature published in a language other than English
- Publication before 2016

Fig. 2. Eligibility Criteria for the Review.

non-empirical research articles.

3.2. Conducting the review

The initial search in WoS and Scopus resulted in 880 articles identified. To assist with screening, Covidence software was employed (Harrison et al., 2020). Covidence is an online workflow platform that aids researchers conducting systematic reviews by collating the review papers, removing duplicates and allowing each researcher to independently and systematically assess the suitability of each paper. Covidence is one of the most proficient tools for removing duplicates and aiding the systematic review process (McKeown & Mir, 2021). Hence, this software assisted in organizing the body of applicable papers but was not used to analyze, interpret or categorize the sample of literature.

From the initial 880 articles, Covidence removed duplicates ($n = 273$), after which two of the researchers screened the abstracts of the remaining articles ($n = 607$) to assess suitability. During this process the abstracts were examined based on the eligibility criteria as outlined in Fig. 2. From this process 101 articles were determined as eligible from the abstract and these articles were read in full by two researchers. The full text review showed 77 articles did not meet the eligibility criteria, resulting in the final sample of 23 articles (see Fig. 3).

The following data were extracted for all 23 articles and compiled into a spreadsheet: author(s), year, journal, research methodology, study context, country, type of technology studied, theories employed, and variables examined. The next step after data extraction involved research synthesis (Tranfield et al., 2003). During this process, two researchers carefully examined the full text of the 23 articles, drawing connections between studies to answer the research questions (See Supplementary Material B for the final sample list, including the coding system applied).

Identification

Records identified from
Scopus and WoS
databases searches
(n = 880)

Search string: (("Augmented Reality")
OR ("Smart Phone") OR ("Mobile
Phone") AND ("Distraction") OR
("Multitasking") AND PUBYEAR >
2016)

Duplicates Identified
(n = 273)

Screening

Records for abstract
screening
(n = 607)

Records removed
(n = 506)

Eligibility

Full-text articles assessed
(n = 101)

Records removed
(n = 77)

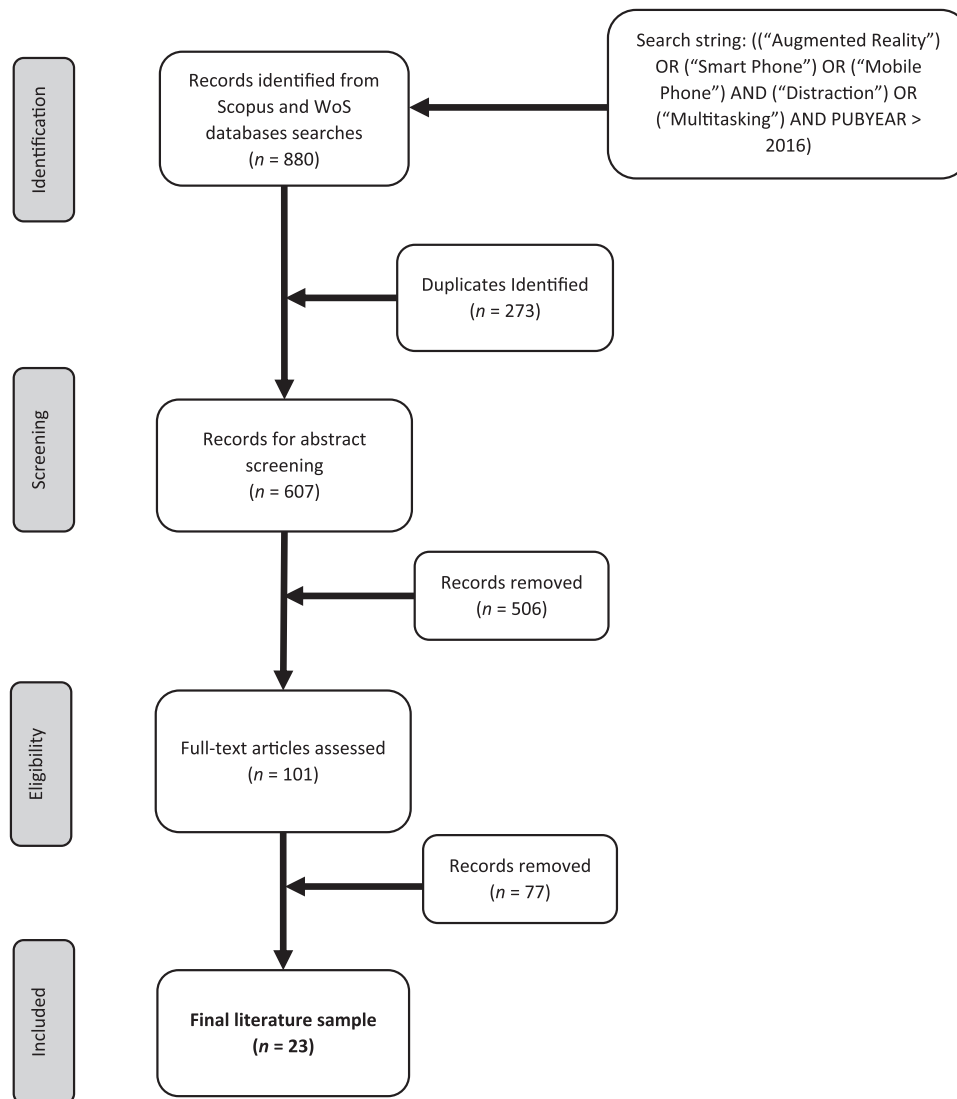**Included**

Final literature sample
(n = 23)

Fig. 3. Systematic Literature Review Process (drawn from Moher et al., 2009).

4. Literature analysis and synthesis

We first analyzed the sample of literature by identifying the following attributes: country, research discipline, journal, and research methodology employed. We note that more research on AR is likely to arise in coming years as the popularity and deployment of AR expands.

The countries examined within the sample shows that the U.S. was the most researched (n = 9), with Germany (n = 4) and China (n = 3) the second and third most common respectively. This shows that the literature is dominated by a Western socio-cultural perspective, and we note that this relatively homogenous view may result in lack of cultural nuance (e.g. differences in collectivism, power-distance) in our understanding of CSD.

Higher Education delivery was the most represented context in the sample (n = 12), followed by retail shopping (including both instore and online (n = 3) and a range of other fields including hospitality services, information and communication technology usage, and health services.

Psychology, information management, information technology, education, marketing, and health were the most observed disciplines in the sample. Although *Computers in Human Behaviour* (n = 3) and *Current Psychology* (n = 3) were the most common journals, the sample was multi-disciplinary, illustrating the breadth of related research on CSD. Table 1 summarizes the most common methodologies employed in our

sample, with surveys (n = 9) and experimental research (n = 9) the most common, followed by field experiments (n = 4) and observation (n = 2). Five studies utilized a mixed method approach. Quantitative methodologies were frequently used in the sample, with qualitative methodologies applied less frequently. Only one study employed a mobile device tracking technique as part of their analysis (T. L. Deng et al., 2019; T. Deng et al., 2019), with most using self-reporting of behavior (e.g. Saunders et al., 2017; Toyama & Hayashi, 2021b). Thus, there is an opportunity for future studies to employ technology that records actual behavior, rather than relying on participant recall.

4.1. Conceptualizations of distraction

As seen from the analysis of contexts within the sample of studies in the previous section, distraction as a focal phenomenon has drawn interest from a range of academic fields. Consolidation of these contexts, and specifically the conceptualizations applied across fields, is beneficial for advancing customer-focused research. Therefore, this section identifies and maps the conceptualizations of CSD within the sample of studies.

4.1.1. Influence of immediate external stimuli and psychological states
Many studies within the sample adopt the foundational

conceptualization of distraction (see Section 2) as arising from the customer's immediate external environment (e.g. having a smartphone nearby, notification settings and task engagement), sometimes accompanied by psychological states (e.g. boredom, state anxiety, expected gain in positive effect). This view focuses on (a) competing sources of information within sensory perception, (b) internally generated cognitive and affective states that make demands on working memory resources, or (c) a combination of these. By adopting this lens, researchers identify stimuli such as sources of information and alerts (e.g. mobile device notification sounds and pop-ups), operationalized as competing for attentional resources during goal-oriented tasks. This stream of research illuminates the relationship between customers and smartphones, including how they monitor, respond to, engage with, and integrate the device into daily life. Theoretical underpinnings linked to CSD at the immediate external environment level apply information processing theories that draw on some variation of the finite cognitive resources principle (e.g. information overload can limit working memory capacity; see e.g. Baron et al., 1973).

Wasmuth et al. (2022) position distraction as a societal concern based on the dynamics between limited working memory resources and the market penetration of mobile devices. Frequent distractions arising from external notifications (haptic, visual, auditory) and habitual, internally generated desires to "check" one's phone represent the most pressing concerns in modern society regarding problematic CSD. Similarly, Sciandra et al. (2019) acknowledge mobile devices as the "principal distractor" in modern life, driven by application-based services across various aspects of consumers' lives, including sleep and diet monitoring, entertainment, social media, and work. Their conceptualization is rooted in consumer marketing literature, examining the role of mobile device use in the pursuit of goal-oriented shopping tasks.

In their study, Sciandra et al. (2019) accept mobile device dependence as unavoidable in many shopping situations, and that usage unrelated to the shopping task is common. A multiple resource theory lens underpins their conceptualization, showing how distinct pools of cognitive resources are applied by customers during simultaneous shopping-related (i.e., goal-oriented) and shopping-unrelated patterns of behavior. In this setting, CSD plays a unique role, as organizations are often interested in what leads to customers making unplanned purchases, or failing to acquire planned purchases, because they were distracted.

Expanding on the role of internally-generated psychological states in CSD, Lee et al. (2020) distinguishes between interruptions arising from an internal need (e.g. boredom driving search for rewarding activities) or external cues (e.g. smartphone vibration). Their study found that both internal and external interruptions lead to greater distraction and poorer task performance. Consistent with Lee et al. (2020), Throuvala et al. (2020) acknowledge the potential of external sources and internal cues (e.g. cognitive salience of media termed 'online vigilance'), which are considered an *approach* motivation to mobile device use. The authors further delineate internal cues as predictors of CSD by suggesting that mobile device use occurs as a means of *avoiding* allocating one's attention to emotionally distressing tasks or situations.

Taken collectively, these conceptualizations highlight the challenges faced by modern customers, who are simultaneously empowered and burdened with ubiquitous smartphone access. The following section examines the broader socio-cultural environment in which customers are embedded, the implications of modern "always connected" social life, and how this operates as an added layer on the immediate environment.

4.1.2. Socio-cultural influences

We identify and classify a subset of the literature as adopting a socio-cultural lens to CSD. This view focuses on 1) social actors (either co-located or virtually present) and 2) social norms or rules (to which the individual perceives to be bound) that can exhibit effects on the frequency and intensity of CSD. Social actors (e.g. friends, family, and associates) can indirectly affect the attentional capacity of a customer by soliciting attention via a mobile device, referred to by Karr-Wisniewki and Lu (2010) as communication overload, one of three key factors of their "technology overload" concept. The social expectation to be contactable and responsive intensifies the relationship between internally generated cognitive and affective states and CSD-related behaviors (Hayashi & Blessington, 2018).

Media convergence and mobile device adoption rates have contributed to an increased acceptance of digital usage behaviors in a wide array of contexts which, until recently, would have been considered technology-free zones. The benefits of instantaneous access to information and communication have served as a kind of "Trojan horse" by which smartphone usage has become prevalent in workplace meetings (Paskewitz & Beck, 2021), interpersonal interactions (Teo et al., 2018), classrooms (Lee et al., 2020), and other social settings such as restaurants (Elias et al., 2021). Some environments are seen as more appropriate in which to use these devices, whereas others continue to have a social stigma attached. Public outdoor locations are deemed acceptable to use smartphones, for example, whereas in the workplace, restaurants, and classrooms, acceptance can vary significantly (Marsh et al., 2018).

In a restaurant, face-to-face communication is an accepted social norm, with smartphone use viewed as intruding on this social situation (Elias et al., 2021). However, when others in the general vicinity (strangers or friends) use smartphones, this can encourage customers to mimic the behavior. In such situations, the social surroundings increase the frequency and likelihood for CSD, due to the so-called "chameleon effect" where observing behavior increases the likelihood of surrounding observers mimicking it. The underlying mechanism of the chameleon effect is the perception–behavior link, a preconscious and non-goal dependent phenomenon where people unintentionally and passively seek to fit in with the social setting (Chartrand & Bargh, 1999).

Group norms explain how behavior is socially regulated, implying that CSD is at least partially governed by the social context in which it occurs (L. T. Deng et al., 2019; L. Deng et al., 2019; Paskewitz & Beck, 2021). These norms act as accepted or implied rules to group members, in turn influencing behavior (Feldman, 1984). Group norms are prominent components of behavior, given that individuals perform in ways perceived as accepted by the groups they associate with (Terry & Hogg, 1996). Social pressure from group norms may be explicit or implicit; for example, group members may explicitly state mobile devices should be put out of reach, while implying a need to attend to others' multi-media communications to maintain social acceptance (Toyama & Hayashi, 2021a). The social influence of others can also arise from a virtual presence, given the capacity of smartphones to facilitate social connections. This can result in virtual social interactions where customers participate in socially motivated behaviors via a smartphone (Teo et al., 2018).

In addition, rules can be established to restrict smartphone use; for example, a teacher in a classroom establishing a no-phone policy (Cutino & Nees, 2017). Unlike norms, rules put in place by authority figures are explicit instructions to ensure members behave accordingly. By establishing a no-phone policy in the classroom, a teacher is applying explicit instructions for the group to follow. Thus, curbing CSD may involve limiting the immediate sensory inputs of the smartphone, while potentially increasing the intensity of internal affective states relating to restricted access. Such increases in CSD at the internal affective state level occur due to perceived social connections and can result in FOMO (fear of missing out; Lee et al., 2020). This can be attributed to the influence of group norms, as FOMO is a response to "missing out" on the social experiences of others observed through the mobile device. This highlights the impact of socio-culturally learned expectations in conditioning internal affective states. The following section discusses how individual characteristics contribute to CSD; their role within the conceptual framework is presented below.

4.1.3. Individual characteristics

The psychological process of CSD is sensitive to individual differences. Our SLR sheds light on the effect of various individual differences with respect to the process and effects of CSD. We identify three types of individual differences applied across the sample of studies examined: (1) cognitive processing and memory capacity differences, (2) personality, behavioral, and attitudinal differences, and (3) demographic differences.

It is worth noting that individual differences are likely to be further accentuated by context, such as task motivation and social expectations, which is apparent in the stream of literature examining how individuals vary in their susceptibility to CSD (e.g. Cutino & Nees, 2017; Toyama & Hayashi, 2021a, 2021b). The foundational conceptualization of distraction outlined in Section 2 acknowledges the cognitive demands of simultaneously processing multiple sources of information. Individuals who display greater working memory capacity and executive function are more equipped to support and process competing stimuli, making them more resistant to CSD (Hayashi & Blessington, 2018). Therefore, customers differ in their vulnerability to information processing demands of media consumed through smartphones, particularly during the pursuit of other daily activities and goals.

In addition to cognitive capacity, an assemblage of personality, behavioral, and attitudinal differences are considered. For example, enduring dispositional characteristics relating to one's ability to regulate impulsiveness (Hayashi & Blessington, 2018) and a preference for polychronicity (Saunders et al., 2017) are considered to attenuate and amplify the propensity for CSD, respectively. Impulsiveness is treated through a behavioral-economic lens by Hayashi and Blessington (2018) where impulsiveness refers to an individual trait characterized by a willingness to seek *smaller-sooner* rewards, even when the required behavior to achieve the reward is knowingly in breach of social norms. Saunders et al. (2017) describe polychronicity as an individual's culturally informed preference for conducting multiple tasks in parallel. Attitudinal beliefs, such as views on the way time should be used, are also considered by Labăr and Ţepordei (2019), suggesting that stable belief structures guide behavioral patterns of smartphone use. A more relaxed perspective on the passage of time would indicate less concern with incomplete goal attainment resulting from CSD. Furthermore, habitual usage patterns formed over time represent behavioral differences that can predict future propensity for CSD. This is a particular concern for young people who may develop addiction-like smartphone use at an early age and continue problematic behaviors without being fully cognizant of their interactions with the smartphone (Graben et al., 2022; Hayashi & Blessington, 2018; Lee et al., 2020).

Consideration of demographic differences is common within our sample of studies. Age, gender, and level of education are applied to investigate cohort effects in CSD susceptibility. Given the focus on smartphones in the current review, we consider age a particularly relevant contingency variable in the customer–device relationship. At the current stage of technology development, many younger customers are now beginning to reach adulthood having had internet access through mobile devices for most of their lives. Such a technology-centric baseline, relative to Generation X and older Millennials, is expected to play a significant role in problematic CSD (Grewal et al., 2018).

In collating variables that reflect the various conceptualizations observed, we consider motivation to be a valuable yet under-researched factor. Graben et al. (2022) make a valuable contribution by incorporating task motivation (studying) when competing stimuli (video games) are available. This raises important questions about the role of procrastination (characterized by a lack of motivation) and how this may contribute to conditions where CSD prevails. The following section presents our conceptual framework, drawn from the reviewed analysis, and then details some of the key specific findings from the review to reveal and synthesize which conditions are associated with, and cause, CSD.

4.2. Antecedents, contingency variables and consequences of CSD

The findings of our review thus far reveal the key perspectives on CSD within our sample of studies and how these have shaped the body of literature under investigation. Section 4.2 serves to pinpoint the specific factors that contribute to, interact with, or result from CSD. Within the sample, each study has been categorized based on the variables examined and aligned to one of three categories: environment and psychological, socio-cultural, and individual (see Fig. 4). Within the analyzed set of studies, a great deal of attention has been given to examining the drivers of CSD, alongside a range of contingency variables. We highlight and summarize the key findings, and comment on the relevance of the empirical results considering the conceptual and theoretical bases from which the literature draws.

Based on review of applicable papers, we find that the dynamic input of both external environmental stimuli and internally generated psychological states act as the key antecedents of CSD which lead to behavioral and psychological consequences for the customer. Socio-cultural and individual factors condition these impacts. Although presented separately, the environmental stimuli and psychological states that we identified are considered interdependent and therefore incorporated in our discussion.

Our findings derived from the SLR suggest socio-cultural influences condition the customer-smartphone relationship at a broad level. Socially, the urge to stay updated and actively participate in online communications within one's networks places customers at risk of exacerbating distraction. The extent of such strong social-connectedness, managed and attended to via smartphones, has implications for both the way customers configure their immediate physical environment (e.g. smartphone within reach during meals or study) and the persistence of psychological states which drain working memory resources at inopportune times. Culturally, value structures and beliefs can also contribute to customers attitudes and behaviors toward technology, including the use of smartphones whilst performing other important tasks. Together, these broad level factors have been shown to condition a customer's propensity for distraction within the sample of literature and represent a critical avenue for consideration in the field. Furthermore, differences at the individual level have received attention in the customer distraction literature, as personality traits, characteristics and demographic variables offer meaningful insights into how customers vary in their susceptibility for distraction. In the following, we discuss our primary findings from the literature review and articulate a series of concise conjectures.
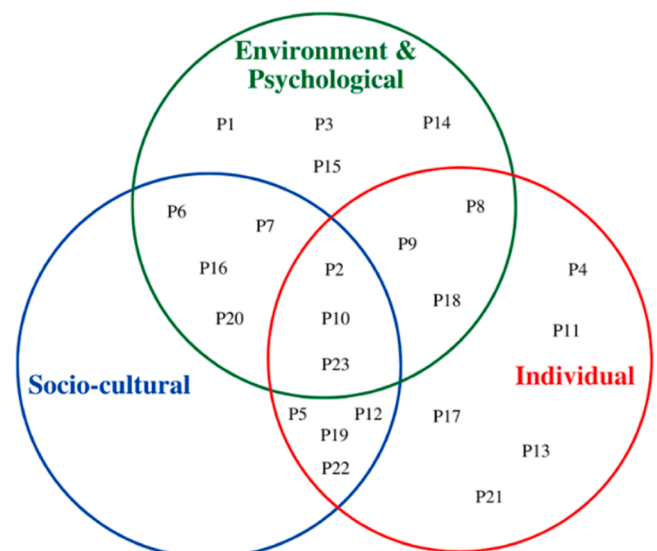

Fig. 4. Venn Diagram of Studied CSD Factors.

4.2.1. Antecedents of CSD: key findings

In an e-commerce setting, Arghashi (2022) conceive CSD as having a mediating effect on two key customer outcomes: hedonic shopping motivations and purchase intentions. A sample of 297 respondents were randomly allocated to participate in a brief trial of either an AR-enabled or non-AR branded mobile app. Although the research design implies an inability to draw causal conclusions, the results suggest that information overload occurring during mobile app use is associated with perceived distraction from the task (i.e. online shopping). This supports the idea that, during goal pursuit, cognitive processing resources suffer under excessive levels of available information within a customer's immediate environment. When considering the relative portability and connectivity of smartphones, such information overload becomes an almost permanent feature of the immediate environment. The SLR findings also suggest that CSD does not have a significant association with reduced hedonic shopping motivation, but that a significant negative effect is observed on purchase intention. Taken together, the results show cognitive activities (e.g. planning future purchases) may suffer more because of CSD, whereas affect-based motivations are less sensitive to such detrimental effects. Therefore, from our synthesis of applicable literature we specify: Conjecture 1a: *Environmental stimuli should affect CSD.*

Adopting a qualitative approach, Deng (2020) explores triggers for adopting multi-tasking behaviors arising from internal or external sources. The key findings suggest that an individual experiences an internal (psychological) drive for adopting multi-tasking behavior, including negative affective states such as boredom or frustration, and cognitive assessments such as progress toward task completion. Interestingly, task division and sequencing were not effective at reducing off-task multi-tasking, as sub-task completion is seen as a logical "rest point" to pause and engage in multi-tasking. As expected, environmental cues (sensory notifications) from smartphones in the vicinity of the subject acted as external multi-tasking cues, but there was consensus among the sample that internally generated triggers for off-task multi-tasking resulted in longer periods of CSD than external triggers. In an experimental setting focused on in-class smartphone use, Lee et al.'s (2020) findings also support the notion that internally generated, affect-based triggers had the most detrimental effect on primary task performance (an in-class quiz). Therefore, we conclude: Conjecture 1b: *Psychological states should affect CSD.*

Wasmuth et al. (2022) acknowledge two distinct but related techniques to minimize distraction: stimulus control and habit reversal, with the former being an attempt to reduce distraction by 'turning off' incoming notifications, and the latter focusing on counteracting internally generated thought patterns by encouraging an alternative behavior. The authors propose that adopting either a stimulus control (for environmental stimuli) or habit reversal (for psychological states) strategy in isolation is not optimal, since it is difficult to disentangle these interdependent forces when an individual attempts to reduce CSD. Further to this reasoning, Dywer et al. (2018) found that customers' smartphone use whilst sharing a meal in a café leads to greater distraction from their primary goal (social interaction/meal consumption) and predicted lower subjective mood. For marketers and customer behavior researchers, negative affective states influenced by CSD threaten to spill over into overall service delivery satisfaction and undermine efforts to enhance the customer experiences.

In sum, it can be concluded that customers directing their attention to smartphone alerts and notifications may seem innocuous but can have detrimental impacts on subjective psychological states. Additionally, customers often experience internally generated states which distract them from consumption goal attainment, and impact checking behaviors and hyper-vigilance toward incoming environmental stimuli. Therefore, we posit: Conjecture 1c: *CSD should demand consideration of the interdependence between environmental stimuli and accompanying psychological states.*

4.2.2. Conditioning role of socio-cultural influences: key findings

4.2.2.1. Formal social settings and CSD.
In the workplace, Paskewitz and Beck (2021) examine perceptions of smartphone use during meetings, regarding the type of usage and whether it relates to work functions or personal social interactions. When asked to assess team-member performance through observing a workplace meeting in which one member's use of a smartphone was manipulated, 825 participants consistently rated those who did not use a smartphone at all as being the most focused, contributing, civil, and effective. If a smartphone was used during a meeting, on-task usage was rated as being more acceptable, with off-task usage the least acceptable. Participants were grouped into undergraduate students (n = 415) and professionals (n = 410), with students found to be harsher evaluators of smartphone use behavior, rating the focus of team members using a smartphone in the meeting significantly lower than professionals. These results show that, in the workplace, group norms exist that prioritize task congruency between the primary (e.g. office meeting participation) and secondary task (mobile device use) to alleviate some of the negative connotations of smartphone use in meetings, and that these norms vary between groups (i.e. students and professionals).

Researchers have investigated whether an authority figure establishing rules reduces CSD (e.g. Cutino et al., 2017; Hayashi & Blessington, 2018; Lee et al., 2020). Cutino et al. (2017) randomly assigned 93 students to either a restricted smartphone access or control condition during a study session. Those in the restricted device group self-reported a higher achievement regarding study goals than those in the control group, who had unrestricted device access. Given students tend to use their smartphone during class irrespective of whether the teacher allows it or not, Lee et al. (2020) investigated how instructing students to use smartphones during class, specifically to help with task completion, would affect CSD and performance. Some 218 students were randomly assigned into two groups: 1) device allowed for academic use and 2) no instruction on device use. All students were allowed to use their device; however, group 1 was explicitly told they should use their device during the class for educational purposes only. Those in group 1 reported greater CSD, leading to poorer test performance, than those in the group with no established norms. The findings from these studies indicate that creation of a rule within the group by an authority figure, such as a teacher to control the environment, is not effective.

4.2.2.2. Informal social settings and CSD.
Service organizations such as restaurants represent environments with fewer norms than a classroom or workplace. By observing shared meals of 58 families, Elias et al. (2021) found that smartphones had a negative influence on parent–child communication. Such communication was avoided through using the device as a form of "pacifier" or "child-minder" so that the parent did not need to occupy the child themselves. Although the smartphone was used by some parents to share an experience (watching a video together), communication avoidance was frequently observed. These findings link to Paskewitz and Beck (2021), who found that task congruency reduces CSD, indicating a larger social risk when a mobile device is used in the presence of others for a task-incongruent purpose. In settings such as service organizations (e.g. restaurants), the development of socialized norms offers a potential solution to educate customers on appropriate device-related behavior.

Another study of meal sharing undertaken by Dwyer et al. (2018) employed a field experiment with 304 community members and students. Participants were asked to share a meal with friends or family, and randomly assigned to the smartphone or deviceless group. In the deviceless group, smartphones had to be turned to silent and placed into a container at the table, creating a new norm for the group members to follow. Those in the smartphone group were more distracted, leading to less perceived enjoyment of the face-to-face interaction than those in the deviceless group. A follow-up experience sampling study using data

from 123 undergraduate participants confirmed this result. Students were surveyed five times a day for one week to report on their feelings and mobile device use, with results showing that device use during in-person interactions increased perceived distraction. CSD in turn predicted lower enjoyment, greater boredom, and worse overall mood, all of which are aligned to an affective internal state. The interconnectedness between socio-cultural and internal psychological factors is evident, as social actors (both those in-person and virtually) demand attention. By responding to the smartphone, attention is being prioritized to the virtual social actor at the expense of the in-person actor. This reduces satisfaction with in-person interactions, with a range of negative psychological consequences.

Social pressure and its influence on behavior is not bound solely to face-to-face scenarios, as evidenced by Teo et al. (2018). As part of an experiment, 50 male adolescents in Singapore were instructed to either 1) message friends via WhatsApp or 2) access and read an article sent via email, with both groups given a snack to eat during the task. The mere online presence of friends and family for those in the social messaging group increased eating behavior, with the authors speculating CSD and social influence as the cause of this. Communication overload from the device is also evident, with attention being diverted from a third-party social presence (Karr-Wisniewski & Lu, 2010). Irrespective of whether the smartphone or the social group is the primary cause, the result of increased eating behavior is concerning, leading to a potential health risk for consumers.

In sum, seminal distraction theory gave precedence to environmental stimuli (Nelson et al., 1993), however human-technology interaction has evolved to integrate internet-connected devices (and the media they transmit) with an array of social and cultural practices (Elias et al., 2021). In turn, socio-cultural contexts in which customers exist are gaining greater importance in the study of CSD. Accordingly, we conclude: Conjecture 2: *CSD should be sensitive to social and cultural norms and should vary depending on context.*

4.2.3. Conditioning role of individual characteristics: key findings

4.2.3.1. Cognitive capacity and CSD. Understanding how personal differences amongst customers account for variance in CSD frequency and intensity is central to the application of risk mitigation strategies for marketers seeking to provide optimal customer experiences. Segmentation, as an effective marketing strategy, derives from a deep, validated knowledge of the customer, involving attitudes, traits, and habitual behaviors relating to technology and media usage (Blut & Wang, 2020; Hollebeek et al., 2019).

Since the fundamental mechanism underlying CSD involves competing working memory resources, several studies focus on individual cognitive differences likely to predict susceptibility. Here, we interpret representative findings that reveal a complex dynamic between the customer and smartphone. Saunders et al., (2017, p. 805) acknowledge that some individuals are better equipped to use cognitive resources than others, or "have learned heuristics to reduce their processing requirements." This raises the possibility that it is not simply the *volume* of information received (e.g. Karr-Wisniewski & Lu, 2010), but instead *how* that information is operated on, which may include both cognitive and affective states. The results of Saunders et al. (2017) show that personal (learned) preference for polychronicity (completing multiple tasks concurrently) can mitigate the negative effect of multiple processing demands as the individual is both motivated and accustomed to doing so.

4.2.3.2. Personality traits and CSD. Stable customer characteristics relating to personality, behavior, and attitudes also offer insights into the CSD process. Specific personality traits relating to self-control and self-efficacy beliefs have yielded mixed results on individual performance under distracting conditions.

Toyama and Hayashi (2021b) applied the "Big Five" personality traits in a hierarchical regression model exploring students' media multi-tasking preferences in the classroom, given a delay discounting scenario with an incoming text message from either a significant other or a casual friend during class. Trait conscientiousness predicts delayed smartphone response behavior when communicating with a significant other, whereas only agreeableness predicts delayed response with a casual friend. Toyama and Hayashi (2021b) acknowledge their explanations are speculative but note the commonalities between conscientiousness and agreeableness center around an individual's ability to suppress a dominant response in favor of a sub-dominant response perceived to be more appropriate or desirable in the context.

4.2.3.3. Habits and CSD. Past behaviors also contribute to CSD susceptibility. Entrenched behavioral patterns may be particularly conducive to CSD since mobile devices encourage regular, habitual checking of the latest information. Smartphones and the applications they support offer unpredictable psychological reinforcement to users and develop a habit of regular checking, placing heavy demands on attention allocation. In an experimental study by Cutino and Nees (2017), participants who self-reported as higher on problematic smartphone use also reported heightened levels of anxiety during the task, but this was not affected by access (restriction) to their device during the study. This suggests that smartphone use may be used to fill a "void" when a customer lacks stimulation. The data reported in Cutino and Nees (2017) also showed that completing a study task without a device present achieved a 12% higher attainment of study goals.

Examining stable, cross-situational factors such as perception of time is another avenue for understanding conditions that lead to CSD. While environmental and cognitive-affective responses are typically fleeting and situationally driven, consistent beliefs about the external world should also be considered. Labăr and Țepordei (2019) examined how attitudes to universal concepts can predict the likelihood of engaging in multi-tasking behaviors. Smartphone multi-tasking behavior positively related to attitudes that concerned the past and present but were negatively related to those concerning the future. These findings serve as a motivation to further disentangle stable individual factors contributing to CSD from more transient environmental factors that can be easily identified and mitigated.

A limited number of studies focused on demographic differences. In a noteworthy exception, age plays a significant role in the allocation of attention to goal-oriented technology usage. Grewal et al. (2018) indicate that, as customers' age, their capacity for accurate information search and filtering (a key task performed by customers using a smartphone) decreases. This is consistent with research that suggests short-term working memory is susceptible to the aging process (Hertzog et al., 2003). Hence, managing CSD in pursuit of efficient goal achievement or optimal consumption experience should consider the life stage of the customer.

In sum, the SLR findings indicate individual customer characteristics regarding personality traits, demographics, cognitive capacity and persistent attitudes and beliefs are all important considerations when explaining individual task motivation, task performance and goal attainment. Accordingly, this suggests that there is no one-size-fits-all approach to managing CSD; different strategies will be required for unique customer segments of the population. Accordingly we conclude: Conjecture 3: *CSD should be sensitive to individual characteristics and should vary depending on individual characteristics.*

4.2.4. Consequences of CSD

Both Sciandra et al. (2019) and Grewal et al. (2018) empirically examine the effects of smartphone use in the pursuit of a structured shopping task. Sciandra et al. (2019) use the limited capacity model to specifically model the effects of multiple cognitive resource sharing during task completion. Shopping-unrelated tasks performed on a

smartphone cause a significant negative impact on the customer's ability to execute a shopping task for pre-planned items, with this effect more pronounced for those with a higher degree of smartphone dependence (Grewal et al., 2018). Again, the impact of CSD on cognitive processing and working memory is evident. Consequently, it can be concluded that the effects of CSD manifest in consumption related patterns of behavior, and psychological consequences which can jeopardize both the successful attainment of consumption goals and more broadly, customer wellbeing. Therefore, we posit: Conjecture 4: *Customers should experience a variety of negative consequences stemming from CSD.*

In summary, applying a holistic conceptualization of CSD is crucial, as a reductive approach which treats each of the factors as independent without careful consideration of how they interact threatens to negate the dynamic nature of customers' complex relationships with smartphones. Smartphones have an enduring and lasting impact on the daily mental states of customers, which is in part due to the elevated status they occupy in daily life. This is an important consideration as previous research (Dwyer et al., 2018) indicates that psychological states are affected by smartphones even when not physically located in the customer's immediate environment. Again, this suggests that our understanding of CSD should be informed by the unique capacity of smartphones to impact customer's thoughts and feelings before, during and after direct use.

CSD should not be reduced to an episode of immediate attention division, but instead should factor in the array of social, cultural, individual and psychological influences. This represents a fundamental difference between the smartphone and preceding stimuli upon which many influential distraction studies are based (Nelson et al., 1985).

5. Expert opinion study

5.1. Method

To further substantiate the conjectures that we have derived from the literature review, we conducted an expert opinion survey involving accomplished marketing professors (Scapolo & Miles, 2006; Schweitzer et al., 2023). Data were obtained from a survey involving 22 experts who were invited to participate through the professional networks of the authors of this study. The experts were chosen based on a range of criteria including: (a) extensive publication record in high-ranking (Q1/A*) marketing, information systems and consumer-behavior journals, (b) citation h-index above 15, (c) editorial association with leading journals (management, marketing, international business) and (d) tenure exceeding 10 years in academia, in line with previous studies (Singh et al., 2022). Most experts in the sample met or exceeded all of these criteria. The responses included answers to open-ended questions eliciting typical real-world examples of what each of the conjectures meant to the experts to ensure they immersed themselves into what the respective conjectures convey, as well as ranking the relevance of each of the conjectures to the field to assess whether the findings from the SLR have been appropriately conceptualized and described.

5.2. Results

All experts provided suitable customer-focused examples to illustrate each of the conjectures. From this we gained confidence that the experts had a clear understanding about what each of our conjectures seeks to convey. Furthermore, these illustrative real-life, practice examples provide face validity, suggesting that our conjectures are relevant not only in a conceptual sense but also practical one. Interestingly, concerning conjectures 1a-1c, even when asked specifically about the environmental stimuli from the smartphone (Conjecture 1a), the experts frequently included psychological aspects in their responses. This supports Conjecture 1c, demonstrating the interdependence of environmental stimuli, where one cannot be considered without the other. See Table 2 for a selection of examples provides by the expert.

Table 2

Expert Examples Illustrating Conjectures.

Conjecture	Expert Identifier	Example Provided
Conjecture 1a	Expert D	*When online shopping, notifications from social media platforms (e.g. Facebook) can pop up and divert our attention to that app. For instance, I am on instagram and a notification pops up to say I have received a message from a Facebook friend I haven't heard from in some time. I click to view that message and have a 30 min online chat with that friend. I fail to return to instagram*
	Expert E	*The vibrations from the smartphone when receiving a notification are the biggest distractions for me. When I get an alert of a new Facebook message, text message, news alert, traffic update etc I have to stop whatever I am doing and check what the notification is.*
	Expert T	*Message notifications buzz while the customer is in store browsing aimlessly - distracting them from the in-store displays and marketing*
Conjecture 1b	Expert A	*When feeling bored, a person opens a social media app on their smartphone. They scroll through engaging content, enjoying likes and comments on their posts. The positive validation and the possibility of finding entertaining content keep them engrossed*
	Expert D	*While shopping in a bricks and mortar retail store (e.g. H&M), the customer may feel bored and not overly stimulated by the servicescape. They may begin searching instagram while they idly flick through the racks. Instead of giving the H&M stock their full attention, they divert most of their attention to their Instagram feed.*
	Expert L	*You face waiting time somewhere and are bored, e.g. public transport. A smartphone offers entertainment; also times seems to pass quicker. Once sucked in, it's hard to stop when you should. If you do stop, it feels like coming back from somewhere else*
	Expert A	*In a state of anxiety, a person receives a notification from their Favorite entertainment app about a new episode. The anxiety makes them hyper-aware of environmental stimuli, and the notification becomes an appealing escape, demonstrating the interplay between psychological states and external stimuli in smartphone distraction.*
Conjecture 1c	Expert D	*When bored, a customer is more likely to view notifications and alerts on their phone. They may be shopping in Myer and simply filling time, waiting to pick their child up from soccer practice. When an alert appears on their phone, indicating that a friend has just posted a pic to Instagram, they will likely view that pic and continue viewing their feed, rather than focusing on viewing stock in Myer.*
	Expert N	*Regarding the fear of missing out or emergency notification due to having only one source of communication tool for all purposes. Thus it increases hypervigilant behavior when it comes to smartphones and distraction.*
	Expert U	*People on the subway (i.e., surrounded by strangers on their smartphones) are more likely to watch an ad on their smartphone as well. I.e., some kind of combination of an external cue and internal anxiety of being in a crowd without seeming busy*
	Expert F	*The context of the event and who you're attending with. Going to restaurant on date night, with family I wouldn't look at phone, going to dinner with friends I would look to phone. Whilst in an appointment with bank lender/doctor, I wouldn't look at my phone, shopping in a retail clothing store I would like at phone*
Conjecture 2	Expert J	*I believe that peer group norms are particularly relevant with age being a particular important determinant of openness to distraction*
	Expert N	*I believe the lines are blurred now when it comes to smartphone use and we are seeing the effects of the breakdown on social norms.*
	Expert D	*Younger consumers are likely to view notifications and alerts as they are generally more sensitive to*

(*continued on next page*)

Table 2 (*continued*)

| Conjecture	Expert Identifier	Example Provided
		social gains to be had through viewing the activity and communications of other users and friends.
Conjecture 3	Expert M	*Certainly young people are seen to be far more active on the phone, using social media. Tech savvy people are more likely to use smart phones to their potential.*
	Expert N	*However, as my personal observation seeing the increasing amount of smartphone use by the older population and people with higher college degrees. However, I believe that personality could be a major factor. It may be interesting to look at Consumer lifestyles, beliefs, and values.*
	Expert I	*Forgot to pay, not completing a transaction, etc*
Conjecture 4	Expert L	*Feeling stressed because you repeatedly check your phone while doing other things. Small distractions add up and cause frustration.*
	Expert R	*Consumers may experience a disruption to their focused attention on completing a task when consuming a service/retail experience such as learning in a University classroom, deciding on a product to purchase in a retail store, accidentally purchasing the wrong product, acting impulsively in purchasing a product, not comprehending information from a service experience such as medical treatment, tax/financial advice, sporting/leisure activity where a customer hurts themselves by not paying attention to what they are doing.*
	Expert T	*I would assume distractions lead to using the phone - including impulse purchases, in-app purchases, etc.*

Each expert was also asked to assess the relevance of each of our conjectures to the study of CSD. All conjectures were shown to be highly relevant by the experts with each conjecture receiving a mean significantly greater than 5 out of 7 (p < .05, Conjecture 1aM = 5.86, SD = 1.17; Conjecture 1bM = 6.18, SD = 1.01; Conjecture 1 cM = 5.68, SD = 1.17; Conjecture 2 M = 6.10, SD = 1.04; Conjecture 3 M =5.76, SD = 1.09; Conjecture 4 M = 6.33, SD =.73).

6. Discussion

In synthesizing and reflecting upon the conjectures that we have derived from the SLR, and opinions provided by expert marketing professors, we establish several commonalities. For example, when directing attention toward distracting stimuli, compulsive behaviors that are both problematic and resistant to self-regulation may emerge. CSD may linger in customers' minds, demanding ongoing attention, despite the smartphone not being present. This is influenced by a perceived, culturally-programmed need for social availability. As smartphones are equally well equipped to support both synchronous and asynchronous communication, the need for constant connectedness results in intrusive thoughts, leading to compulsive device monitoring behaviors. Unplanned behavior and negative psychological outcomes arise when customers are distracted, indicating goal-orientation (e.g. online shopping) suffers when attention is not sustained on a focal task. Taken collectively, the situation for smartphone-equipped customers appears dire, as both self-regulation strategies and imposed social rules (e.g. banning usage in the workplace) do not sufficiently mitigate the negative outcomes of CSD. Despite the establishment of these commonalities to understand CSD, research has been deficient to theoretically explain these processes in a unifying framework.

To assist in better understanding this phenomenon, we draw on Cognitive-Affective Personality System (CAPS) theory (Mischel & Shoda, 1995), as a unifying theory to clarify our conjectures and develop research propositions that are encapsulated in our theoretical CSD framework (Fig. 5). In this framework we outline that the dynamic input of both external environmental stimuli and internally generated psychological states act as the key antecedents of CSD which lead to behavioral and psychological consequences for the customer. Socio-cultural and individual factors are embedded to condition these impacts. Although presented separately in our framework, the environmental stimuli and psychological states are considered interdependent components of a dynamic system.

Our conjectures suggest socio-cultural influences condition the customer-smartphone relationship at a broad level. Socially, the urge to
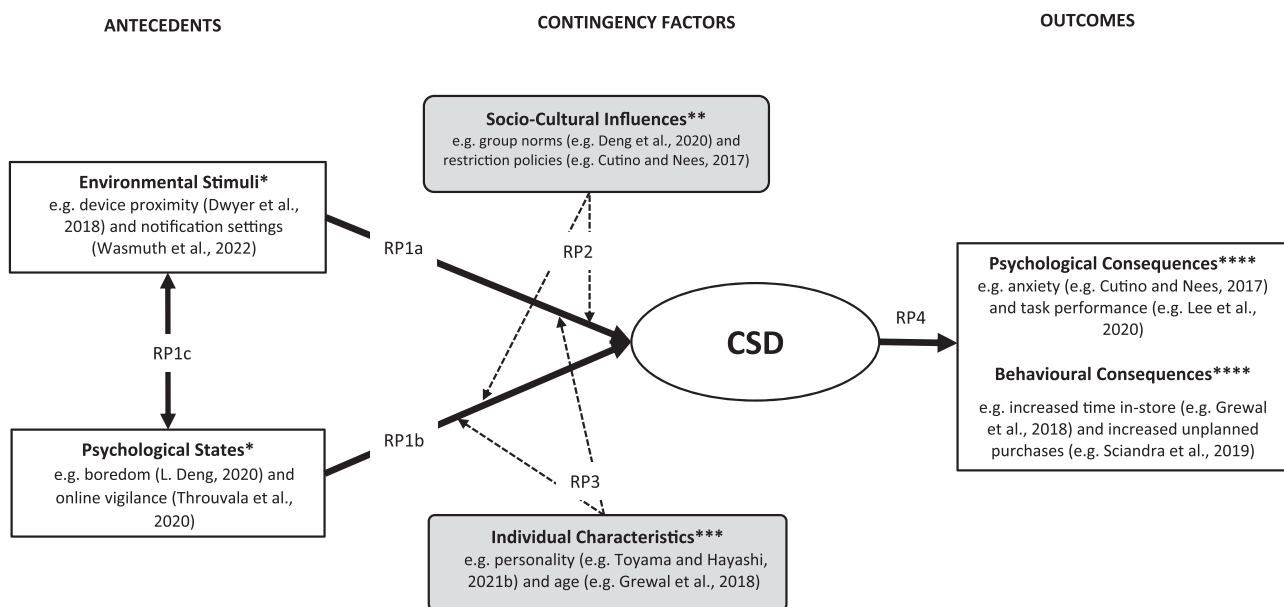
Fig. 5. Theoretical CSD Framework. * Refer to Section 4.2.1 discussion. * * refer to Section 4.2.2 discussion. * ** refer to Section 4.2.3 discussion. * ** * refer to Section 4.2.4 discussion. A comprehensive list of all examined variables across the reviewed sample, including brief explanations, is provided in Supplementary Material C.

stay updated and actively participate in online communications within one's networks places customers at risk of exacerbating distraction. The extent of such strong social connectedness, managed and attended to via smartphones, has implications for both the way customers configure their immediate physical environment (e.g. smartphone within reach during meals or study) and the persistence of psychological states which drain working memory resources at inopportune times. Culturally, value structures and beliefs can also contribute to customers attitudes and behaviors toward technology, including the use of smartphones whilst performing other important tasks. Together, these broad level factors have been shown to condition a customer's propensity for distraction within the sample of literature and represent a critical avenue for consideration in the field. Furthermore, differences at the individual level have received attention in the customer distraction literature, as personality traits, characteristics and demographic variables offer meaningful insights into how customers vary in their susceptibility for distraction.

6.1. A cognitive-affective personality system theory of CSD

CAPS theory provides a dynamic and context-dependent framework for understanding personality. It emphasizes the interaction between cognitive and affective processes, encoding strategies, beliefs, and emotional responses in shaping an individual's behavior across different situations (Mischel & Shoda, 1995). As such, individuals are not seen as passive emitters of behavior that is entirely predetermined by personality traits, but rather as active agents that flexibly respond to perceived situational contingencies. In the context of customer behavior and CSD, CAPS theory can shed light on the underlying mechanisms and factors contributing to the CSD phenomenon. In consumption settings, customers are bombarded with a plethora of stimuli, including advertisements, product displays, ambient noise along with their smartphone technology. These stimuli can overload cognitive resources, disrupt customer's attentional focus, trigger emotional reactions and lead to suboptimal decision-making processes. Here, customers may employ different encoding strategies, such as selective attention or filtering, to manage the information influx (Kahneman, 1973). However, the effectiveness of these strategies may vary across individuals based on their cognitive-affective units and personality traits. We describe these underlying mechanisms and factors contributing to CSD according to CAPS theorizing next.

6.1.1. Antecedents of CSD

CAPS theory suggests that individuals develop unique encoding strategies to process information in various situations. Environmental stimuli play a significant role in shaping these strategies, especially in the context of smartphone use in consumption experiences which include various sensors, such as proximity sensors and ambient light sensors, which detect changes in the environment (Straczkiewicz et al., 2021). For example, when a smartphone's ambient light sensor detects low light conditions in a retail environment, it may trigger the device's screen to adjust brightness. Such environmental cues can attract users' attention to their smartphones even when they were not actively engaging with them.

CAPS theory also emphasizes the role of individuals' expectancies and beliefs in shaping their behavioral responses. Environmental stimuli within a consumption experience, such as the sound of incoming notifications or the visual cues of blinking screens, act as triggers that align with users' expectancies. For instance, individuals expect notifications to contain relevant information or social interactions where these environmental triggers can prompt customers to divert their attention from their current tasks to check their smartphones (Wilmer et al., 2017). Environmental stimuli associated with smartphones can also elicit emotional responses, such as curiosity or anxiety (Rosen et al., 2013). Here, CAPS theory recognizes that affective states influence behavior. In the presence of stimuli such as notification sounds or

vibrations, individuals may experience heightened emotional responses triggering a desire to interact with their smartphones, causing distraction from their immediate surroundings or tasks (e.g. shopping, accessing customer service).

CAPS theory further acknowledges that individuals exhibit consistent patterns of behavior across different situations. Environmental cues, such as location-based triggers or contextual information (e.g., being in a coffee shop where smartphone use is common), can be associated with specific behavioral signatures (Montag et al., 2015). In such environments, individuals may be more likely to succumb to smartphone distractions due to the contextual cues provided by the environment. CAPS theory's notion of personality coherence suggests that individuals may consistently demonstrate certain behaviors across situations (Mischel & Shoda, 1995). Environmental sensitivity, which can vary among customers, may play a role in smartphone distractions. Some customers may be more attuned to environmental stimuli and thus more susceptible to smartphone-related distractions in specific settings or situations. Taken collectively, we posit:

Research Proposition 1a. : Environmental Stimuli Affect CSD.

Since CAPS theory suggests that individuals develop unique encoding strategies to process information in various situations, an individual's psychological state, such as stress, anxiety, or boredom, can significantly influence these encoding strategies when using smartphones (Elhai et al., 2016), including during a consumption experience. For example, a customer experiencing stress may turn to their smartphone as a coping mechanism, seeking distraction from their current psychological discomfort. CAPS theory further highlights the role of customer' beliefs and expectancies in shaping their behavioral responses such as their smartphone use. In CSD, someone feeling lonely may expect that engaging with their smartphone will alleviate their loneliness by connecting them to others through social media (Elhai et al., 2018). These expectancies can drive distraction as customers seek emotional relief or social gratification.

A customer's psychological state can also elicit a range of affective responses that impact smartphone use. For example, a customer experiencing anxiety may receive a notification on their smartphone, which triggers a heightened emotional response and prompts them to check their device immediately (Kushlev et al., 2016). This emotional reaction can contribute to distraction from the consumption experience. Finally, CAPS theory recognizes that customers exhibit consistent patterns of behavior across different situations. A customer's psychological state can manifest as a behavioral signature in smartphone use. For instance, someone feeling bored during a lecture or meeting may engage in smartphone activities to alleviate their boredom, leading to distraction from the primary activity (Dwyer et al., 2018). Based on the above discussion, we posit:

Research Proposition 1b. : Psychological States Affect CSD.

Based on the findings derived from the preceding studies, it was concluded that customers directing their attention to smartphone alerts and notifications may seem innocuous but can have detrimental impacts on subjective psychological states. Additionally, customers often experience internally generated states which distract them from consumption goal attainment, and impact checking behaviors and hypervigilance toward incoming environmental stimuli. CAPS theory emphasizes the dynamic interaction between cognitive and affective processes, encoding strategies, and behavioral responses, which can be applied to understand the intricate relationship between environmental stimuli and psychological states in the context of smartphone distraction in consumption settings. Understanding this interdependence can inform strategies to manage distractions and promote more mindful smartphone use in various consumption contexts. Therefore, we posit:

Research Proposition 1c. : CSD Demands Consideration of the Interdependence Between Environmental Stimuli and Accompanying

Psychological States.

6.1.1.1. Conditioning role of socio-cultural influences. Findings from our research show that seminal distraction theory gave precedence to environmental stimuli (Nelson et al., 1993), however human-technology interaction has evolved to integrate internet-connected devices (and the media they transmit) with an array of social and cultural practices (Elias et al., 2021). This results in socio-cultural contexts in which customers exist gaining greater relevance in the study of CSD. When considering the role of sociocultural norms, the findings of the preceding research emphasise the binding nature of social and cultural expectations, many of which may vary across distinct social groups within which an individual participates. According to CAPS theory (Mischel & Yoda, 1995), individuals are not passive reactors to situations, but rather are active and goal-directed in their encoding of available variables and cues to determine situation-appropriate behavioral responses. This is particularly relevant to the study of CSD, as customers not only contend with the challenge of integrating social cues from the immediate physical environment (e.g. dining in a restaurant), but also their own learned experiences from similar social situations, and additionally the socio-cultural norms associated with either synchronous or asynchronous smartphone-based interactions with their social networks (e.g. attending to the comments of a social media post).

This adds complexity to understanding CSD, as customers' may struggle to reconcile and attend to the competing social and cultural expectations from social actors within their physical location (e.g. friends, family, restaurant staff), and those virtually accessible via a smartphone (e.g. broader social networks, professional colleagues, social media communities). Attending to the latter discreetly, so as not to violate the former, can result in CSD that is difficult for observers (and researchers) to comprehend. Alternatively, social situations in which there are weaker established norms regarding smartphone use may imply a sense of 'permission' to engage in CSD behaviors as there is low perceived social risk in doing so. Therefore, we posit:

Research Proposition 2. : CSD is Sensitive to Social and Cultural Norms and May Vary Depending on Context.

Our findings show individual customer characteristics regarding personality traits, demographics, cognitive capacity and persistent attitudes and beliefs are all important considerations when explaining individual task motivation, task performance and goal attainment. CAPS theory suggests that personality traits play a particularly critical role which interact with cognitive-affective processes in goal pursuit. In the context of CSD, individuals with specific personality traits, such as impulsivity or low self-control, may be more prone to experiencing negative consequences from CSD (Billieux et al., 2008). This is because these traits can amplify the compulsive use of smartphones and exacerbate the negative outcomes stemming from CSD. CAPS theory also suggests that personality traits and psychological states interact. For example, individuals with high levels of trait anxiety may be more susceptible to distraction by smartphones when they are in a heightened state of anxiety (Billieux et al., 2008). The interaction between traits and states can influence how customers respond to smartphone-related distractions during consumption experiences. As such, we posit:

Research Proposition 3. : CSD is Sensitive to Individual Characteristics and May Vary Depending on Individual Characteristics.

6.1.2. Consequences of CSD

The findings of our research indicate that the effects of CSD manifest in consumption related patterns of behavior, and psychological consequences which can jeopardize both the successful attainment of consumption goals and also more broadly, customer wellbeing. CAPS theory suggests that individuals develop unique encoding strategies to process information based on their cognitive-affective units and the context they

find themselves in (Mischel & Shoda (1995). In the context of CSD, customers with a predisposition to compulsive smartphone use may employ encoding strategies that prioritize smartphone interactions over other activities, leading to neglect of important tasks or responsibilities (Lee et al., 2014). CAPS theory further highlights the role of individuals' beliefs and expectancies in shaping their behavioral responses. Compulsive smartphone users often have expectations of immediate gratification and emotional relief from smartphone interactions (Elhai et al., 2018). However, these expectancies may not align with reality, leading to frustration and negative emotions when the expected rewards are not met. When customers experience negative emotions due to missed opportunities, neglected responsibilities, or strained interpersonal relationships resulting from excessive smartphone use, they may engage in even more compulsive smartphone use as a way to cope with these negative emotions (Kushlev et al., 2016). In the case of CSD, compulsive smartphone users may exhibit a behavioral signature characterized by persistent checking of their devices, even when it is detrimental to their well-being (Elhai et al., 2016). Therefore, we posit:

Research Proposition 4. : Customers can Experience a Variety of Negative Consequences Stemming from CSD.

Overall, our theoretical framework, underpinned by CAPS theory, presents four overarching research propositions that encapsulate the chief findings from our research and guide the conceptualization of CSD, see Table 3.

6.2. Contributions to research/theoretical implications

From a theoretical perspective, this study advances new knowledge in understanding CSD by applying Cognitive-Affective Personality System (CAPS) theory as a valuable lens to explain how customers become distracted in CSD related consumption experiences within the information systems and marketing domain. This theoretical perspective offers novel insights into the complex interplay between cognitive and affective processes, encoding strategies, and behavioral responses in the context of smartphone technology-mediated consumption experiences. This theoretical integration lends greater potential to CSD, helping to understand existing results and frame future research questions.

In this realm of research, customers often engage with various digital platforms, applications, and devices simultaneously. CAPS theory helps elucidate how the cognitive load associated with managing multiple information sources can lead to distractions. Customers may struggle to allocate their attention effectively in consumption experiences, resulting in decreased task performance, and increased susceptibility to distraction during goal pursuit.

For researchers interested in the study of CSD, there is an emerging foundation of literature from the past two decades that explores many of the salient aspects. A key implication for theorizing CSD arising from the development of our theoretical framework, from the perspective of CAPS theory, is that the finite pool of cognitive resources used to allocate attention not only competes with other non-task related environmental stimuli, but also with subjective psychological states. The interdependence between these two factors suggests a holistic approach is needed which integrates cognitive and affective states during periods

Table 3
Research Propositions.

Research Propositions
RP1a: Environmental stimuli affect CSD.
RP1b: Psychological states affect CSD.
RP1c: CSD demands consideration of the interdependence between environmental stimuli and accompanying psychological states.
RP2: CSD is sensitive to social and cultural norms and may vary depending on context.
RP3: CSD is sensitive to individual characteristics and may vary depending on individual characteristics.
RP4: Customers can experience a variety of negative consequences stemming from CSD.

of task performance that is best suited to the advancement of distraction theory in consumption contexts.

Furthermore, the conditioning effects of individual characteristics and sociocultural factors extend our understanding of how distraction transpires. Beyond motivation for goal-oriented task performance, an array of individual traits should be considered, which can jeopardize attention allocation and intensify the drivers of distraction. Some of these may not be immediately obvious to either the customers themselves, or indeed to those studying distraction. Similarly, even though smartphone use can occur whilst physically alone, CSD should not be considered to occur 'in a vacuum', but rather, it is embedded in broader social and cultural consumption contexts. The extent to which a customer perceives, encodes and feels bound by the social and cultural norms of their daily lives impacts their technology usage behavior, and subsequent propensity for CSD.

The findings of our research have significant implications for future research on CSD and open various pathways for critical enquiry. Underpinned by CAPS theory, the theoretical framework put forth in Fig. 5 distills the key contributing factors to CSD, along with outcomes, as examined in recent customer-focused literature. For scholars interested in CSD, our framework acknowledges the dynamic, subjective, socioculturally-conditioned nature of customers' interactions with smartphones, which, in turn, exposes several questions for future research (see Table 4), that align to our research propositions. Operationalization of the CSD construct in future research invites opportunities to develop research objectives which closely reflect the role of the smartphone in a customer's daily life.

Novel effects surely exist and remain undiscovered in the way environmental stimuli (alerts, notifications, haptics; see Section 4.2.1) affect customer's attentional resources. We consider this to be the central stream of continuing CSD research, particularly if technological

capacity expands to stimulate a greater array of sensory responses (e.g. olfactory; Errajaa et al., 2021). To further this stream, we suggest three research questions (RQ1 – RQ3) regarding the influence of environmental stimuli and psychological states, where we suggest each need to be considered separately, as well as in combination, to provide a holistic understanding of how to manage CSD. The most apparent opportunities to add to this stream, however, and indeed to maintain currency with the customer-smartphone relationship, rely on the integration with other CSD-focused streams shown in our framework (presented in Fig. 5).

Limitations to research designs mean capturing reliable data simultaneously across all aspects of the theoretical model may be unfeasible. To overcome such limitations, we propose a context-centric approach to the operationalization of CSD in scholarly research. Specifically, the primary effect(s) of interest in a CSD-related study should be viewed through the lens of the context they align to, by considering the interdependence between the environmental stimuli diverting attentional resources and accompanying cognitive, affective, and embodied states. This is particularly salient in light of the emergence of customer-focused technologies, such as generative AI tools (Pantano & Scarpi, 2022), immersive "Metaverse" branded environments (Dwivedi et al., 2022) and mixed reality advertising channels that transcend online and offline boundaries. We acknowledge the relevance of context through the proposed research questions 4–6 (Table 4), which suggest that better understanding of the role of social and cultural norms, and context, can further illuminate CSD.

Where practical, the next step is to layer the individual characteristics and sociocultural effects onto the study design. These recommendations are, of course, open to interpretation. Some factors, such as individual characteristics, may be best suited as measured variables, whilst others may lend themselves to experimental manipulation (e.g. sociocultural norms and rules). Our research questions suggest a starting point for researchers to consider applying these individual characteristics, specifically age (RQ7) and personality types (RQ 8).

The sample of studies contained within our SLR adheres to a common theoretical base, and as such, the conclusions drawn tend to align to the traditional cognitivist school of thought. This approach favors the "mind as computer" metaphor, where mental processes occur on amodal symbols and representations in the mind, with little regard for how incoming stimuli might be encoded in the specific sensory modality in which they are received. Considering the implications of CAPS theory and recent developments in alternative psychological theories to classical information processing – for example, situated cognition theory (Robbins et al., 2009) – we expect there are many theoretical advancements to be made in understanding the process of CSD and attention allocation by customers. By replacing the "mind as a computer" metaphor with an embodied approach, researchers could shift the focus from internal mental representations of technological stimuli (e.g. mobile device content) toward a more holistic, embodied view of cognitive processes, which could lead to new insights into a range of important cognitive phenomena, including language comprehension and social interactions. This has important implications for customer experience design to develop a more intuitive, context-sensitive interface that aligns with the ways customers naturally process information when using smartphones and mobile devices broadly.

Such an advanced frontline interface could improve service quality and offer customers more effective and enjoyable online shopping. Although some information processing models acknowledge the distinct physiological brain regions used to process different sensory stimuli (e.g. audio versus visual), emerging research programs in cognitive science increasingly explore perception, cognition, emotion, and behavior through an embodied (sometimes called "situated" or "grounded"; e.g. Barsalou, 2008) lens, which may reveal a deeper, more nuanced understanding of distraction phenomena.

Finally, research should not only look at the contributing factors to CSD, but also the outcomes and consequences for customers, aligning to our last four research questions. As we show in our review a range of

Table 4
Research Propositions and Associated Research Questions.

Research Propositions	Research Questions
RP1a: Environmental stimuli affect CSD. RP1b: Psychological states affect CSD. RP1c: CSD demands consideration of the interdependence between environmental stimuli and accompanying psychological states.	1. What affective states primarily influence CSD? 2. What cognitive states primarily influence CSD? 3. What combination of strategies is most effective at mitigating environmental stimuli and psychological states to manage CSD?
RP2: CSD is sensitive to social and cultural norms and may vary significantly depending on context.	1. Which social norms impact the use of smartphones across a range of contexts? 2. In what cultural contexts is CSD more prevalent? 3. How can social norms on smartphone usage be established and maintained to reduce the potential for distraction?
RP3: CSD is sensitive to individual characteristics and may vary significantly depending on individual characteristics.	1. What CSD reduction strategy is most effective for young customers versus older customers? 2. How do CSD reduction strategies need to be adapted for different individual characteristics such as personality type? 3. What are the short-term and long-term negative consequences of CSD?
RP4: Customers can experience a variety of negative consequences stemming from CSD	4. Does the context of the smartphone usage (e.g. entertainment vs utilitarian) significantly influence the negative consequences of CSD? 5. What strategies are most effective for educating customers on the negative influences of CSD? 6. How can customer's knowledge and understanding of CSD be improved to ensure customer well-being?

negative consequences can come from CSD, however, more research is needed to confirm the short-term and long-term consequences (research question 9) and whether or not smartphone usage context influences these consequences (research question 10). An appropriate next step for researchers in customer behavior and information systems is to narrow in on the specific platforms and applications commonly causing distraction, to better understand specific motivational drivers of problematic use. Of interest is the role habitual behavior plays in sustained CSD. Research could focus specifically on the historical patterns of individuals regarding distraction caused by favored media types, to disentangle active pursuit behavior from mere habitual reflexive behavior. This stream of research is likely to be valuable in providing more targeted solutions to distraction-prone customers based on individual traits and tendencies toward media consumption during specific scenarios (e.g. during goal-oriented consumption tasks, in unfamiliar social settings, or during periods of low psychological stimulation such as waiting in a queue). From there researchers can then establish the most effective strategies for educating customers on these consequences (RQ11 and RQ12).

6.3. Implications for practice

Our review reveals several crucial implications for managers seeking to reduce the negative impact of smartphone distraction among customers and broader stakeholders. To frame our discussion, without diminishing the potential impacts on other stakeholders, we take the view that managers are interested in how distraction affects performance and are primarily concerned with two key stakeholder groups: employees (internal) and customers (external). The current body of literature reveals perspectives on the fundamental psychological process of distraction in the smartphone era. Elimination of immediate sensory distractors appears to be a superficial solution, as stated in RP1b. Since smartphones have made spatiotemporal boundaries irrelevant for media consumption and social communication, their impact on customers' attentional resources transcends the need for physical co-location with either (a) other social actors or (b) fixed-location media sources (e.g. a television). The effect on attention is that customers now feel more compelled to be socially contactable ("online") and aim to minimize the amount of time during which they are unable to check for incoming notifications from social or professional networks (see RP1c).

For customers, the task becomes more challenging again. The nature of the customer–firm relationship affords less direct control to managers in implementing any reasonable sort of policy or "rule" by which customers must abide, even in a physical store environment. Although it is conceivable that some service delivery settings may impose "no mobile device" rules, these are typically adhered to in respect of social norms and the willingness to behave accordingly among others. In a cinema, patrons refrain from taking a phone call during a film, not because of fear of retribution from cinema staff, but primarily as the behavior would violate established cultural norms. Again, the solution we suggest is a subtle shifting of the social norms and expectations from within salient customer groups, which may serve to reduce negative distraction effects from smartphone use from the managerial perspective. Managers must comprehend the importance of socializing role readiness for customers regarding the appropriate use of smartphones to maximize the quality of customer experiences.

Currently there is little specific guidance in the extant literature on what might mitigate problematic smartphone use during consumption or information processing settings that interfere with the customer experience. Literature from more diverse fields offers useful guidelines from which marketing managers can learn. For example, national cultural differences in acceptance of multi-tasking provide a valuable segmentation variable for international retailers, particularly in the design and deployment of user experience interfaces and information-heavy product or service-related tasks. American cultural norms promote multi-tasking more than German or Japanese cultures (Tinsley, 1998).

In cultures where multi-tasking is more valued and accepted, promoting concentration on a singular primary task may be less collectively adhered to. Practitioners are advised to broaden their perspective beyond the 'out of sight, out of mind' assumption in regard to CSD. As such, we encourage consideration of the implications of RP2. Here, we suggest adopting measures such as cultural re-alignment through education programs to create more desirable established norms regarding smartphone use.

We propose an analysis of the sequencing of tasks within a customer journey, as the potential for information overload to derail progress toward goal achievement in consumption settings may have relatively under-acknowledged effects on customer conversion rates and purchase frequency. This is particularly relevant given the role smartphones play in both online and offline transaction-related decision making at both the pre-purchase and purchase stages. Such efforts could also be supported by organizational socialization initiatives to ensure customer role readiness of smartphones so that customers are prepared on how best to use such technology (e.g. provision of specific behavioral guidelines) to maximize the quality-of-service encounters with the organization. Practically, customer segmentation based on individual characteristics (see RP3) can help customize marketing communications, service design and customer experience programs that are sympathetic to individual characteristics which exacerbate CSD throughout the customer journey.

6.4. Implications for society

Our SLR suggests that serious costs to individuals, and society, arise from smartphone distraction (see RP4). Negative implications resulting from device distraction include poor educational performance (Cutino & Nees, 2017; L. Deng, 2020), poor interpersonal relationships and well-being (Dwyer et al., 2018; Elias et al., 2021), increased food consumption (Teo et al., 2018), and increased unplanned purchases (Grewal et al., 2018; Sciandra et al., 2019). To begin reducing this negative influence of distraction, individual customers need to increase their self-control and learn how to regulate their behavior. Enforcement by authority figures (e.g. managers, policy) cannot be an all-inclusive solution as there are limits to their influence on behavior. In some cases, authority leaders can establish rules to control the environment (e.g. no-device policy, behavioral guidelines to enhance the quality of a consumption experience); however, social norms, determined by the behaviors and actions of the majority, are much more powerful in many environments. In addition, there are many situations in which rules cannot be effectively enforced by authority figures since social norms already exist implying device use is permitted (e.g. heritage tourism, public places and retail stores). Therefore, the onus of mobile device use, and its subsequent impact on attention, lies with customers themselves.

Customers must be educated on how best to monitor, regulate, and control their behavior to become empowered and in control of their own choices toward technology. Programs focused on prioritizing wellbeing or practicing alternative behavior to counteract mobile device addiction-like behavior (Wasmuth et al., 2022) should be communicated and made easily accessible to consumers. Without information and education, customers will struggle to understand the full cost of device distraction and lack strategies on how to achieve behavior change. Responsible consumption of technology aligns with the United Nations Sustainable Development Goals (i.e. Goal 12: Responsible Consumption and Production) (United Nations, 2022; Dwivedi et al., 2021). To enable truly responsible consumption, all organizations incorporating mobile, or AR experiences must ensure that devices are not negatively affecting users. Mobile device distraction has the potential to significantly influence mental health and long-term wellbeing (Roberts & David, 2016) and thus negatively affect progress toward Sustainable Development Goal 12. Therefore, we suggest organizations, brands, and government all have a role to play in educating and supporting customers on how to minimize device distraction to efficiently achieve consumption-related goals in a socially responsible fashion.

There is the potential for social norms to change as the negative disruptive influence of mobile devices becomes more apparent. This change is potentially beginning with apps such as *Space*, *Freedom*, and *Digital Wellbeing* (Winkelman & Beaton, 2022), and customers are trying to empower themselves through "Control the Scroll" (Euromonitor, 2023) and social media platforms such as BeReal that involve less time and limits to users' ability to post per day (2 min). Education and messaging to customers from government or organizations will help speed up this process. Mobile devices and their integration into everyday activities are here to stay, if not grow. Customers need to adapt and responsibly use these devices to avoid becoming distracted.

Beyond enabling and empowering customers to minimize mobile device distraction, developing informed policy relating to the use of mobile devices is critical to ensure safe, educated use and responsible consumption, particularly by young people. For policy makers to enact positive change, there must first be a recognition of the growing problem of technological distraction and its impact on productivity, mental wellbeing, and social cohesion. Furthermore, to position any policy to achieve maximum societal benefit, policy makers rely on accessing current and impactful research that explains the phenomena of interest.

The effect of marketing and advertising delivered through mobile devices is a growing issue in many countries. Many of the media and applications identified as causing distraction (e.g. social media and video sharing) share a business model reliant on mass attention in order to sell digital inventory to advertisers. In many cases, marketing messages may be intrusive, especially during periods of focused concentration. Given the growth in personalization of marketing communications delivered based on behavior-tracking technology, it may be necessary for policy makers to implement a "cap" on the frequency and intensity of marketing and advertising delivered to an individual within a specified time frame. Such measures may aid in reducing task-unrelated distractions; for example, limiting exposure to online shopping advertising during office hours. Given mobile restrictions are being brought into place across broad contexts such as the banning of entire social media platforms (TikTok in some states of the United States; Anguiano, 2023) and stringent data privacy laws (such as the General Data Protection Rules (GDPR) in Europe; Gundlapalli, 2023), there is reason to believe that other bans could be put into place if an argument can be made that society will benefit. We suggest that a cap should be brought into place by the developers of the smartphones themselves so that they are held as responsible for the consumption devices they are creating. Governments may instead be able to offer action here as they have done in the above-mentioned examples.

6.5. Limitations and future research directions

When conducting this systematic literature review, efforts were made to include all relevant research in the field of CSD; however, this review is not without limitations, which must be considered, and which also provide avenues for further research.

First, we acknowledge that many other specific branches of technology exist within a customer's daily assemblage that may also influence distraction (e.g. wearable technology, social media, and in-home AI devices). Hence, future reviews of this area may consider applying our conceptual model to examine other more nuanced contexts involving technologies such as video-based social media platforms (e.g. Instagram and TikTok/DouYin), streaming services such as Netflix and Amazon Prime, video games, and online shopping. While all of these can be readily accessed through a mobile device, each represents a specific and distinct usage motivation from the customer's perspective. Focusing on specific use cases may reveal more about the underlying psychological processes, such as when an individual interacts with passive versus active media (e.g. streaming a film compared with playing an online video game) and the relationship with distraction.

Second, researchers may also consider undertaking a meta-analytic study to determine the relative effect size of customers' exposure to distracting stimuli in consumption, service, and branded online experiences. Such work could further reveal which aspects of distraction result in the strongest effect on customer's attention, and whether various sensory modalities are more vulnerable to distraction (e.g. auditory versus visual).

Third, future research should seek to further explore the impact of 'feedback loop' type effects on CSD, where customers may exhibit habitual patterns of behavior, reinforced by prolonged instances of distraction. For example, CAPS theory helps explain how negative emotional states may motivate a customer to engage with social media to 'disconnect' from reality, but excessive usage may exacerbate these negative emotions, leading to chronic, problematic usage to escape undesirable emotional states. Currently, there is little guidance in the literature for managers concerned with achieving positive psychological outcomes by designing digital experiences with customer wellbeing in mind.

7. Conclusions

Customers are living in a world of rapidly evolving technology, and the avenues for distraction are ever-increasing; thus, our appetite for distraction remains a widespread concern. Our SLR has investigated the current state of research on the influence of smartphone distraction in the context of consumption experiences. This was achieved by identifying 23 articles out of 880 related articles on smartphone distraction, across disciplines, since 2016. All articles were examined by assessing the theories, contexts and variables investigated.

The findings of our review are encapsulated in a set of conjectures indicating that environmental stimuli, psychological states, sociocultural influences and individual characteristics all influence CSD, resulting in both behavioral and psychological consequences for customers. Supplemented by views on these conjectures provided by 22 expert marketing professors and CAPS theory, a unifying theoretical framework has been developed to highlight the interconnection between the antecedents and contingency variables to CSD, implying that controlling one element of the framework will not be enough to minimize the effects of CSD. We presented six propositions that are embedded within the framework, and twelve associated research questions, on the state of CSD arising from our research in the hopes that future research will continue to pursue this topic. These propositions are relevant for academics, practitioners and society. Continued investigation into this topic is essential to ensure society and customers are responsibly consuming these technologies rather than to excessive distraction.

CRediT authorship contribution statement

Alex Taylor: Conceptualization, Methodology, Writing, Data curation, Data analysis. **Marguerite Hook**: Conceptualization, Methodology, Writing, Data curation, Data analysis. **Jamie Carlson**: Conceptualization, Methodology, Writing, Data curation. **Siggi Gudergan**: Supervision, Conceptualization, Writing – review & editing. **Tomas Falk**: Supervision, Conceptualization, Writing – review & editing.

Declaration of Competing Interest

The authors did not receive any funding to support the research reported in this paper. We have no conflicting interests which would compromise the validity of this research.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.ijinfomgt.2023.102722.

References

Agarwal, S., Kumar, S., & Goel, U. (2019). Stock market response to information diffusion through internet sources: A literature review. *International Journal of Information Management, 45*, 118–131. https://doi.org/10.1016/j.ijinfomgt.2018.11.002

Anguiano, D., 2023, Montana Becomes First US State to Ban TikTok. https://www.forbes.com/sites/forbestechcouncil/2023/05/30/reinventing-anti-money-laundering-how-federated-learning-can-power-fund-diversion-detection-and-gdpr-compliance/?sh=447618016334.

Arghashi, V. (2022). Shopping with augmented reality: How wow-effect changes the equations! *Electronic Commerce Research and Applications, 54*, Article 101166. https://doi.org/10.1016/j.elerap.2022.101166

Baron, R. S., Baron, P. H., & Miller, N. (1973). The relation between distraction and persuasion. *Psychological Bulletin, 80*(4), 310.

Barsalou, L. W. (2008). Grounded cognition. *Annual Review of Psychology, 59*, 617–645.

Berry, A. S., Demeter, E., Sabhapathy, S., English, B. A., Blakely, R. D., Sarter, M., & Lustig, C. (2014). Disposed to distraction: genetic variation in the cholinergic system influences distractibility but not time-on-task effects. *Journal of Cognitive Neuroscience, 26*(9), 1981–1991.

Billieux, J. (2012). Problematic use of the mobile phone: A literature review and a pathways model. *Current Psychiatry Reviews, 8*(4), 299–307.

Billieux, J., Van der Linden, M., & Rochat, L. (2008). The role of impulsivity in actual and problematic use of the mobile phone. *Applied Cognitive Psychology, 22*(9), 1195–1210.

Blut, M., & Wang, C. (2020). Technology readiness: A meta-analysis of conceptualizations of the construct and its impact on technology usage. *Journal of the Academy of Marketing Science, 48*(4), 649–669.

Borges, A. F. S., Laurindo, F. J. B., Spínola, M. M., Gonçalves, R. F., & Mattos, C. A. (2021). The strategic use of artificial intelligence in the digital era: Systematic literature review and future research directions. *International Journal of Information Management, 57*, Article 102225. https://doi.org/10.1016/j.ijinfomgt.2020.102225

Bruni, R., & Piccarozzi, M. (2022). Industry 4.0 enablers in retailing: A literature review. *International Journal of Retail & Distribution Management, 50*(7), 816–838. https://doi.org/10.1108/IJRDM-07-2021-0314

Busch, P. A., & McCarthy, S. (2021). Antecedents and consequences of problematic smartphone use: A systematic literature review of an emerging research area. *Computers in Human Behavior, 114*, Article 106414.

Carlson, J., Rahman, M. M., Taylor, A., & Voola, R. (2019). Feel the VIBE: Examining value-in-the-brand-page-experience and its impact on satisfaction and customer engagement behaviours in mobile social media. *Journal of Retailing and Consumer Services, 46*, 149–162.

Carvalho, L. F., Sette, C. P., & Ferrari, B. L. (2018). Problematic smartphone use relationship with pathological personality traits: Systematic review and meta-analysis. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace, 12*(3).

Chang, L. L., Backman, K. F., & Huang, Y. C. (2014). Creative tourism: A preliminary examination of creative tourists' motivation, experience, perceived value and revisit intention. *International Journal of Culture, Tourism and Hospitality Research, 8*(4), 401–419.

Chartrand, T. L., & Bargh, J. A. (1999). The chameleon effect: The perception–behavior link and social interaction. *Journal of Personality and Social Psychology, 76*(6), 893.

Chen, L., Nath, R., & Tang, Z. (2020). Understanding the determinants of digital distraction: An automatic thinking behavior perspective. *Computers in Human Behavior, 104*, Article 106195.

Chen, Q., & Yan, Z. (2016). Does multitasking with mobile phones affect learning? A review. *Computers in Human Behavior, 54*, 34–42.

Chotpitayasunondh, V., & Douglas, K. M. (2016). How "phubbing" becomes the norm: The antecedents and consequences of snubbing via smartphone. *Computers in Human Behavior, 63*, 9–18.

Cutino, C. M., & Nees, M. A. (2017). Restricting mobile phone access during homework increases attainment of study goals. *Mobile Media & Communication, 5*(1), 63–79. https://doi.org/10.1177/2050157916664558

de Ruyter, K., Heller, J., Hilken, T., Chylinski, M., Keeling, D. I., & Mahr, D. (2020). Seeing with the customer's eye: Exploring the challenges and opportunities of AR advertising. *Journal of Advertising, 49*(2), 109–124.

Deng, L. (2020). Laptops and mobile phones at self-study time: Examining the mechanism behind interruption and multitasking. *Australasian Journal of Educational Technology, 36*(1), 55–67. https://doi.org/10.14742/ajet.5048

Deng, L., Ku, K. Y. L., & Kong, Q. (2019). Examining predictive factors and effects of in-class multitasking with mobile phones. *Interactive Technology and Smart Education, 16*(1), 49–58. https://doi.org/10.1108/ITSE-08-2018-0056

Deng, T., Kanthawala, S., Meng, J., Peng, W., Kononova, A., Hao, Q., Zhang, Q., & David, P. (2019). Measuring smartphone usage and task switching with log tracking and self-reports. *Mobile Media & Communication, 7*(1), 3–23. https://doi.org/10.1177/2050157918761491

Diegmann, P., Schmidt-Kraepelin, M., Eynden, S., & Basten, D. (2015). Benefits of augmented reality in educational environments—A systematic literature review. *Wirtschaftsinformatik Proceedings, 103*.

Dwyer, R. J., Kushlev, K., & Dunn, E. W. (2018). Smartphone use undermines enjoyment of face-to-face social interactions. *Journal of Experimental Social Psychology, 78*, 233–239.

Dwivedi, Y. K., Hughes, L., Baabdullah, A. M., Ribeiro-Navarrete, S., Giannakis, M., Al-Debei, M. M., Dennehy, D., Metri, B., Buhalis, D., Cheung, C. M. K., Conboy, K., Doyle, R., Dubey, R., Dutot, V., Felix, R., Goyal, D. P., Gustafsson, A., Hinsch, C., Jebali, I., & Wamba, S. F. (2022). Metaverse beyond the hype: Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management, 66*, Article 102542.

Dwivedi, Y. K., Ismagilova, E., Hughes, D. L., Carlson, J., Filieri, R., Jacobson, J., Jain, V., Karjaluoto, H., Kefi, H., Krishen, A. S., Kumar, V., Rahman, M. M., Raman, R., Rauschnabel, P., Rowley, J., Salo, J., Tran, G. A., & Wang, Y. (2021). Setting the future of digital and social media marketing research: Perspectives and research propositions. *International Journal of Information Management, 59*, Article 102168.

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.

Elias, N., Lemish, D., & Rovner-Lev, G. (2021). Food for thought: Parent-child face-to-face communication and mobile phone use in eateries. *Journal of Family Communication, 21*(4), 272–286. https://doi.org/10.1080/15267431.2021.1953501

Errajaa, K., Legohérel, P., Daucé, B., & Bilgihan, A. (2021). Scent marketing: linking the scent congruence with brand image. *International Journal of Contemporary Hospitality Management, 33*(2), 402–427.

Euromonitor International, 2023, Top 10 global consumer trends 2023. ⟨https://go.euromonitor.com/white-paper-EC-2023-Top-10-Global-Consumer-Trends-EN.html⟩.

Eysenck, M. W., & Graydon, J. (1989). Susceptibility to distraction as a function of personality. *Personality and Individual Differences, 10*(6), 681–687. https://doi.org/10.1016/0191-8869(89)90227-4

Feldman, D. C. (1984). The development and enforcement of group norms. *Academy of Management Review, 9*(1), 47–53.

Festinger, L., & Maccoby, N. (1964). On resistance to persuasive communications. *The Journal of Abnormal and Social Psychology, 68*(4), 359.

Forster, S., & Lavie, N. (2016). Establishing the Attention-Distractibility Trait. *Psychological Science, 27*(2), 203–212. https://doi.org/10.1177/0956797615617761

Gillie, T., & Broadbent, D. (1989). What makes interruptions disruptive? A study of length, similarity, and complexity. *Psychological Research, 50*(4), 243–250.

Graben, K., Doering, B. K., & Barke, A. (2022). Playing smartphone games while studying: An experimental study on reading interruptions by a smartphone game. *Education and Information Technologies, 27*(3), 3965–3980. https://doi.org/10.1007/s10639-021-10764-0

Grewal, D., Ahlbom, C.-P., Beitelspacher, L., Noble, S. M., & Nordfält, J. (2018). In-store mobile phone use and customer shopping behavior: Evidence from the field. *Journal of Marketing, 82*(4), 102–126. https://doi.org/10.1509/jm.17.0277

Grzegorczyk, T., Sliwinski, R., & Kaczmarek, J. (2019). Attractiveness of augmented reality to consumers. *Technology Analysis & Strategic Management, 3*(11), 1257–1269.

GSMA, 2023, The Mobile Economy 2023. https://www.gsma.com/mobileeconomy/wp-content/uploads/2023/03/270223-The-Mobile-Economy-2023.pdf.

Gundlapalli, C., 2023, Reinventing Anti-Money Laundering: How Federated Learning Can Power Fund Diversion Detection and GDPR Compliance. https://www.forbes.com/sites/forbestechcouncil/2023/05/30/reinventing-anti-money-laundering-how-federated-learning-can-power-fund-diversion-detection-and-gdpr-compliance/?sh=447618016334.

Han, J. J., & Broniarczyk, S. M. (2021). Multitasking as consumer compensatory control. *Journal of Consumer Research, 48*(3), 456–473.

Hanin, M. L. (2021). Theorizing digital distraction. *Philosophy & Technology, 34*(2), 395–406.

Harrison, H., Griffin, S. J., Kuhn, I., & Usher-Smith, J. A. (2020). Software tools to support title and abstract screening for systematic reviews in healthcare: An evaluation. *BMC Medical Research Methodology, 20*(1), 1–12.

Hayashi, Y., & Blessington, G. P. (2018). A behavioral economic analysis of media multitasking: Delay discounting as an underlying process of texting in the classroom. *Computers in Human Behavior, 86*, 245–255. https://doi.org/10.1016/j.chb.2018.04.049

Hayashi, Y., & Nenstiel, J. N. (2021). Media multitasking in the classroom: Problematic mobile phone use and impulse control as predictors of texting in the classroom. *Current Psychology, 40*(9), 4500–4506. https://doi.org/10.1007/s12144-019-00395-7

He, J., McCarley, J. S., Crager, K., Jadliwala, M., Hua, L., & Huang, S. (2018). Does wearable device bring distraction closer to drivers? Comparing smartphones and Google Glass. *Applied ergonomics, 70*, 156–166.

Hertzog, C., Dixon, R. A., Hultsch, D. F., & MacDonald, S. W. (2003). Latent change models of adult cognition: Are changes in processing speed and working memory associated with changes in episodic memory? *Psychology and Aging, 18*(4), 755.

Hilken, T., de Ruyter, K., Chylinski, M., Mahr, D., & Keeling, D. I. (2017). Augmenting the eye of the beholder: Exploring the strategic potential of augmented reality to enhance online service experiences. *Journal of the Academy of Marketing Science, 45*(6), 884–905.

Hollebeek, L. D., Sprott, D. E., Andreassen, T. W., Costley, C., Klaus, P., Kuppelwieser, V., Karahasanovic, A., Taguchi, T., Islam, J. U., & Rather, R. A. (2019). Customer engagement in evolving technological environments: synopsis and guiding propositions. *European Journal of Marketing, 3*(9), 2018–2023.

Ho, M. H. W., & Chung, H. F. (2020). Customer engagement, customer equity and repurchase intention in mobile apps. *Journal of Business Research, 121*, 13–21.

International Journal of Information Management, 2022, Call for papers. -sciencedirect-com.ezproxy.newcastle.edu.au/journal/international-journal-of-information-management/about/call-for-papers.

Jessen, A., Hilken, T., Chylinski, M., Mahr, D., Heller, J., Keeling, D. I., & de Ruyter, K. (2020). The playground effect: How augmented reality drives creative customer engagement. *Journal of Business Research, 116*, 85–98.

Jing, C., Shang, C., Yu, D., Chen, Y., & Zhi, J. (2022). The impact of different AR-HUD virtual warning interfaces on the takeover performance and visual characteristics of autonomous vehicles. *Traffic Injury Prevention, 23*(5), 277–282. https://doi.org/10.1080/15389588.2022.2055752

Kalaitzaki, A., Laconi, S., & Tsouvelas, G. (2022). Problematic Internet, Smartphone, and SMS Use among Adults: Shared and Unique Predictors. *Journal of Research in Health Sciences, 22*(4).

Karr-Wisniewski, P., & Lu, Y. (2010). When more is too much: Operationalizing technology overload and exploring its impact on knowledge worker productivity. *Computers in Human Behavior, 26*(5), 1061–1072.

Keating, J. P., & Brock, T. C. (1974). Acceptance of persuasion and the inhibition of counterargumentation under various distraction tasks. *Journal of Experimental Social Psychology, 10*(4), 301–309. https://doi.org/10.1016/0022-1031(74)90027-4

Kitchenham, B., Pearl Brereton, O., Budgen, D., Turner, M., Bailey, J., & Linkman, S. (2009). Systematic literature reviews in software engineering – A systematic literature review. *Information and Software Technology, 51*(1), 7–15. https://doi.org/10.1016/j.infsof.2008.09.009

Kushlev, K., Proulx, J. D., & Dunn, E. W. (2016). Silence your phones: Smartphone notifications increase inattention and hyperactivity symptoms. *Mobile Media & Communication, 4*(1), 69–85.

Labăr, A. V., & Ţepordei, A. M. (2019). The interplay between time perspective, internet use and smart phone in-class multitasking: A mediation analysis. *Computers in Human Behavior, 93*, 33–39. https://doi.org/10.1016/j.chb.2018.11.050

Lammers, H. B. (1982). Effects of biased scanning and distraction on cognitive responses. *The Journal of Social Psychology, 116*(1), 99–105.

Lee, Y. K., Chang, C. T., Lin, Y., & Cheng, Z. H. (2014). The dark side of smartphone usage: psychological traits, compulsive behavior and technostress. *Computers in Human Behavior, 31*, 373–383.

Lee, S., McDonough, I. M., Mendoza, J. S., Brasfield, M. B., Enam, T., Reynolds, C., & Pody, B. C. (2020). Cellphone addiction explains how cellphones impair learning for lecture materials. *Applied Cognitive Psychology, 35*(1), 123–135. https://doi.org/10.1002/acp.3745

Lindström, B., Bellander, M., Schultner, D. T., Chang, A., Tobler, P. N., & Amodio, D. M. (2021). A computational reward learning account of social media engagement. *Nature Communications, 12*(1), Article 1311. https://doi.org/10.1038/s41467-020-19607-x

Marengo, D., Sindermann, C., Häckel, D., Settanni, M., Elhai, J. D., & Montag, C. (2020). The association between the Big Five personality traits and smartphone use disorder: A meta-analysis. *Journal of Behavioral Addictions, 9*(3), 534–550.

Marsh, J. E., Ljung, R., Jahncke, H., MacCutcheon, D., Pausch, F., Ball, L. J., & Vachon, F. (2018). Why are background telephone conversations distracting? *Journal of Experimental Psychology: Applied, 24*(2), 222–235. https://doi.org/10.1037/xap0000170

Massaro, M., Dumay, J., & Guthrie, J. (2016). On the shoulders of giants: Undertaking a structured literature review in accounting. *Accounting, Auditing & Accountability Journal, 29*(5), 767–801. https://doi.org/10.1108/AAAJ-01-2015-1939

McDaniel, B. T., & Coyne, S. M. (2016). "Technoference": The interference of technology in couple relationships and implications for women's personal and relational well-being. *Psychology of Popular Media Culture, 5*(1), 85–98.

McDaniel, B. T., & Radesky, J. S. (2018). Technoference: Parent distraction with technology and associations with child behavior problems. *Child Development, 89*(1), 100–109.

McFarlane, D. C. (1999). Coordinating the interruption of people in human-computer interaction. *Interact, 99*, 295.

McKeown, S., & Mir, Z. (2021). Considerations for conducting systematic reviews: Evaluating the performance of different methods for de-duplicating references. *Systematic Reviews, 10*(38), 1–8.

McLean, G., & Wilson, A. (2019). Shopping in the digital world: Examining customer engagement through augmented reality mobile applications. *Computers in Human Behavior, 101*, 210–224.

Mick, D. G., & Fournier, S. (1998). Paradoxes of technology: Consumer cognizance, emotions, and coping strategies. *Journal of Consumer Research, 25*(2), 123–143.

Mischel, W., & Shoda, Y. (1995). A cognitive-affective system theory of personality: Reconceptualizing situations, dispositions, dynamics, and invariance in personality structure. *Psychological Review, 102*(2), 246.

Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLOS Medicine, 6*(7), Article e1000097.

Montag, C., Błaszkiewicz, K., Sariyska, R., Lachmann, B., Andone, I., Trendafilov, B., & Markowetz, A. (2015). Smartphone usage in the 21st century: who is active on WhatsApp? *BMC Research Notes, 8*(1), 1–6.

Nelson, J. E., Duncan, C. P., & Frontczak, N. T. (1985). The distraction hypothesis and radio advertising. *Journal of Marketing, 49*(1), 60–71.

Nelson, J. E., Duncan, C. P., & Kiecker, P. L. (1993). Toward an understanding of the distraction construct in marketing. *Journal of Business Research, 26*(3), 201–221. https://doi.org/10.1016/0148-2963(93)90032-K

Oraison, H., Nash-Dolby, O., Wilson, B., & Malhotra, R. (2020). Smartphone distraction-addiction: Examining the relationship between psychosocial variables and patterns of use. *Australian Journal of Psychology, 72*(2), 188–198.

Osterhouse, R. A., & Brock, T. C. (1970). Distraction increases yielding to propaganda by inhibiting counterarguing. *Journal of Personality and Social Psychology, 15*(4), 344.

Palmatier, R. W., Houston, M. B., & Hulland, J. (2018). Review articles: Purpose, process, and structure. *Journal of the Academy of Marketing Science, 46*, 1–5.

Pantano, E., & Scarpi, D. (2022). I, robot, you, consumer: Measuring artificial intelligence types and their effect on consumers emotions in service. *Journal of Service Research, 25*(4), 583–600.

Paskewitz, E. A., & Beck, S. J. (2021). Put the phone away!": Does text message content influence perceptions of group member texting? *Computers in Human Behavior, 115*, Article 106591. https://doi.org/10.1016/j.chb.2020.106591

Petty, R. E., Wells, G. L., & Brock, T. C. (1976). Distraction can enhance or reduce yielding to propaganda: Thought disruption versus effort justification. *Journal of Personality and Social Psychology, 34*(5), 874.

Petticrew, M. and Roberts, H. (2006). How to Appraise the Studies: An Introduction to Assessing Study Quality. In Systematic Reviews in the Social Sciences (eds M. Petticrew and H. Roberts). -org.ezproxy.newcastle.edu.au/10.1002/9780470754887.ch5.

Pivetta, E., Harkin, L., Billieux, J., Kanjo, E., & Kuss, D. J. (2019). Problematic smartphone use: An empirically validated model. *Computers in Human Behavior, 100*, 105–117.

Plangger, K., Grewal, D., de Ruyter, K., & Tucker, C. (2022). The future of digital technologies in marketing: A conceptual framework and an overview. *Journal of the Academy of Marketing Science, 50*, 1125–1134.

Robbins, P., & Aydede, M. (2009). A short primer on situated cognition. In P. Robbins, & M. Aydede (Eds.), *The Cambridge handbook of situated cognition* (pp. 3–10). Cambridge University Press.

Roberts, J. A., & David, M. E. (2016). My life has become a major distraction from my cell phone: Partner phubbing and relationship satisfaction among romantic partners. *Computers in Human Behavior, 54*, 134–141. https://doi.org/10.1016/j.chb.2015.07.058

Roberts, J. A., Pullig, C., & Manolis, C. (2015). I need my smartphone: A hierarchical model of personality and cell-phone addiction. *Personality and Individual Differences, 79*, 13–19.

Romano, B., Sands, S., & Pallant, J. I. (2021). Augmented reality and the customer journey: An exploratory study. *Australasian Marketing Journal, 29*(4), 354–363.

Rosen, L. D., Whaling, K., Rab, S., Carrier, L. M., & Cheever, N. A. (2013). Is Facebook creating "iDisorders"? The link between clinical symptoms of psychiatric disorders and technology use, attitudes and anxiety. *Computers in Human Behavior, 29*(3), 1243–1254.

Saunders, C., Wiener, M., Klett, S., & Sprenger, S. (2017). The impact of mental representations on ICT-related overload in the use of mobile phones. *Journal of Management Information Systems, 34*(3), 803–825. https://doi.org/10.1080/07421222.2017.1373010

Singh, S., Nicely, A., Day, J., & Cai, L. (2022). Marketing messages for post-pandemic destination recovery- A Delphi study. *Journal of Destination Marketing and Management*. https://doi.org/10.1016/j.jdmm.2021.100676

Scapolo, F., & Miles, I. (2006). Eliciting experts' knowledge: A comparison of two methods. *Technological Forecasting and Social Change, 73*(6), 679–704.

Schweitzer, F., Malek, S. L., & Sarin, S. (2023). Exploring the future of market driving: A dialogue with marketing thought leaders. *Industrial Marketing Management, 113*, 277–294.

Sciandra, M. R., Inman, J. J., & Stephen, A. T. (2019). Smart phones, bad calls? The influence of consumer mobile phone use, distraction, and phone dependence on adherence to shopping plans. *Journal of the Academy of Marketing Science, 47*(4), 574–594. https://doi.org/10.1007/s11747-019-00647-9

Straczkiewicz, M., James, P., & Onnela, J. P. (2021). A systematic review of smartphone-based human activity recognition methods for health research. *NPJ Digital Medicine, 4*(1), 148.

Teo, E., Goh, D., Vijayakumar, K. M., & Liu, J. C. J. (2018). To message or browse? Exploring the impact of phone use patterns on male adolescents' consumption of palatable snacks. *Frontiers in Psychology, 8*, Article 2298. https://doi.org/10.3389/fpsyg.2017.02298

Terry, D. J., & Hogg, M. A. (1996). Group norms and the attitude-behavior relationship: A role for group identification. *Personality and Social Psychology Bulletin, 22*(8), 776–793.

Throuvala, M. A., Griffiths, M. D., Rennoldson, M., & Kuss, D. J. (2020). Mind over matter: Testing the efficacy of an online randomized controlled trial to reduce distraction from smartphone use. *International Journal of Environmental Research and Public Health, 17*(13), 4842. https://doi.org/10.3390/ijerph17134842

Tinsley, C. (1998). Models of conflict resolution in Japanese, German, and American cultures. *Journal of Applied Psychology, 83*(2), 316.

Toyama, M., & Hayashi, Y. (2021a). Links of personality traits to media multitasking: Conscientiousness predicts mobile phone use in the college classroom. *Current Psychology, 41*(12), 8660–8667. https://doi.org/10.1007/s12144-020-01258-2

Toyama, M., & Hayashi, Y. (2021b). Personality and media multitasking in the college classroom: Context-dependent implications of conscientiousness and agreeableness. *Current Psychology*. https://doi.org/10.1007/s12144-021-01793-6

Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management, 14*(3), 207–222.

United Nations, 2022, THE 17 GOALS | Sustainable Development. https://sdgs.un.org/goals.

Van Deursen, A. J., Bolle, C. L., Hegner, S. M., & Kommers, P. A. (2015). Modeling habitual and addictive smartphone behavior: The role of smartphone usage types, emotional intelligence, social stress, self-regulation, age, and gender. *Computers in Human Behavior, 45*, 411–420.

Wasmuth, J. M., Reinhard, I., Hill, H., Alpers, G. W., Shevchenko, Y., Kiefer, F., & Leménager, T. (2022). A smarter way to use your smartphone: An intervention to limit smartphone-related distractions reduces hyperactivity but not inattention symptoms. *European Addiction Research, 28*(4), 255–266. https://doi.org/10.1159/000521693

Wheelwright, T., 2022, January 24, 2022 cell phone usage statistics: How obsessed are we? https://www.reviews.org/mobile/cell-phone-addiction/.

Wilmer, H. H., Sherman, L. E., & Chein, J. M. (2017). Smartphones and cognition: A review of research exploring the links between mobile technology habits and cognitive functioning. *Frontiers in Psychology, 8*, 605.

Winkelman, S., & Beaton, P., 2022, The best screen-time apps to get your digital like under control. https://www.digitaltrends.com/mobile/best-apps-for-limiting-your-screen-time/#:~:text=your%20Apple%20devices.-,Social%20Fever,various%20apps%20including%20social%20media.

Yan, M., Filieri, R., & Gorton, M. (2021). Continuance intention of online technologies: A systematic literature review. *International Journal of Information Management, 58*, Article 102315. https://doi.org/10.1016/j.ijinfomgt.2021.102315

Young, K., & Regan, M. (2007). Driver distraction: A review of the literature. In I. J. Faulks, M. Regan, M. Stevenson, J. Brown, A. Porter, & J. D. Irwin (Eds.), *Distracted Driving* (pp. 379–405). Australasian College of Road Safety.

Yung, R., & Khoo-Lattimore, C. (2019). New realities: A systematic literature review on virtual reality and augmented reality in tourism research. *Current Issues in Tourism, 22*(17), 2056–2081. https://doi.org/10.1080/13683500.2017.1417359