Digital consumption and socio-normative vulnerability

Abstract

Digital consumption is expanding human boundaries and offering us unprecedented opportunities, while simultaneously redefining human capabilities, eroding individuality, and compromising ethical purpose; this is giving rise to a condition of digital consumerism through technological overdependence. Individuals' self-preserving autonomy, reasoning, ideologies, and ethical status are being compromised due to a growing compulsion for digital consumption, which is leading to the onset of digital harm. This study offers novel insights into the technological interventions that are giving rise to excessive digital consumption leading to digital harm. It also suggests how the effects of such harm can be mitigated through the lenses of two complementary theories: Self-determination theory (SDT) and Agentic theory. We identify five constructs of digital harm through epistemic discourse analysis and use thematic analysis to examine how the digital harm that affects individual rationality, maturity and autonomy can be mitigated by practising attributes of SDT and Agentic theory. This study shows the extent to which SDT and Agentic theory can help to explain how people collectively conceptualize, adapt, define and use the technology that constrains them as self-realizing rational beings.

Keywords: Digital consumption, Digital harm, Self-determination theory (SDT), Agentic theory, Epistemic discourse analysis, Thematic analysis

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1. Introduction

A growing compulsion for digital consumption is reshaping our democracy and institutions, changing economies, reimagining our perceptions, delegating our reasoning, influencing our normative practices, and eroding our sense of being; in other words, our self-autonomy is affecting our fundamental socio-psychological well-being. *The Global Risks Report 2018* by the World Economic Forum (WEF) indicates that adverse consequences of digital compulsion are emerging, despite being subtle and under-recognized as key societal risks.[1] Digital consumption through excessive use of technology can result in digital harm and compromise our privacy (Richards, 2013), transfer our real physical lives into virtual reality (Staniewski and Awruk, 2022), constrain our human privilege and ethical identity (Zuboff, 2015, 2019), affect social and cultural norms (Jung et al., 2016; Sheth, 2011), erode our autonomy (O'Connor and Weatherall, 2019), sanitize radicalization (Huey, 2015), influence geopolitical affairs (Allcott and Gentzkow, 2017), polarize social groups (Sunstein, 2008), cause addiction (Bhargava and Velasquez, 2020), compromise decision-making (Duan et al., 2019), affect user trust (Shareef et al., 2020), affect moral identity as an antecedent of constructive voice behaviour (Bhatti et al., 2020), and generate behavioural disorders (Karim and Chaudhri, 2012; Robbins and Clark, 2015; Tao et al., 2010). Despite these studies having explored various effects of digital harm from different perspectives, the literature is rather fragmented and sparse in identifying the key constructs of digital harm and how to address them.

Higher digital consumption and dependence are leading us to exploitation through socio-normative vulnerability (Wood, 2016), unwarranted digital risk (Marelli et al., 2020) and the privacy paradox (Martin, 2020). Therefore, instead of preserving humanness, ethics and individual autonomy, we are perceiving ourselves through psychodynamic object relations, that is, our nurtured intelligence is being re-imaged through digital means (Turkle, 2003). Individual autonomy, intelligence and ethical identity, and independence from external obligations, governmental control and social pressure, as originally framed by Locke and Hobbes, are still the dominant features of modern liberalism and

[1] https://www.weforum.org/reports/the-global-risks-report-2018. Accessed on 17/04/2021.

libertarianism (Kompa, 2016). Such human attributes are now extensively affected by digital consumerism; thus, we use two socio-psychological theories – Self-Determination Theory (SDT) and Agentic theory (Bandura, 2001, 2006, 2011a, 2011b; Deci and Ryan, 2000, 2012a, 2012b) – to find potential answers as to how to mitigate digital harm. In particular, isolation, depression, low self-esteem and autonomy, inability to make specific decisions, lack of connectedness, and moral questioning are among the many adverse effects of digital consumerism. However, socio-psychological studies (Baek et al., 2013; Seabrook et al., 2016; Wilson et al., 2012) and technological-ethical studies (Aladwani and Almarzouq, 2016; Staniewski and Awruk, 2022; Tan et al., 2021) have produced mixed evidence regarding the adverse effects of digital consumption and digital harm. Thus, we attempt to address the following research questions:

RQ1: What are the constructs of digital harm that arise from excessive digital consumption?

RQ2: Can SDT and Agentic theory explain the extent to which individual rationality, maturity, ethics and autonomy are affected by digital consumption?

RQ3: Can the attributes of SDT and Agentic theory help in mitigating digital harm?

Our study offers three significant and novel contributions. First, considering that digital consumption is a contemporary, emerging phenomenon within the socio-psychological and technological-ethical literature referring to the adverse consequences of technology and unethical behaviour, we identify through epistemic discourse analysis five core constructs of digital harm: (1) socio-psychological deficiency; (2) augmented reality; (3) unethicality and trust erosion; (4) compulsive behaviour; and (5) differentiated distance. Second, we combine two dominant but complementary socio-psychological theories – SDT and Agentic theory – to explain the extent to which individual rationality, maturity, ethics and autonomy can be affected, helping us to understand individuals' thoughts and behaviours better. Further, to understand how digital consumerism arises when an individual deliberately or implicitly defers or delegates their own independent reasoning to socio-technological systems or authorities, we explore how attributes of SDT and Agentic theory can help developing a cohesive solution to address issues of digital consumerism. Third, to validate our conceptualization, we undertake a thematic analysis using a set of semi-structured interviews and show

that the harms associated with excessive digital consumption can be mitigated using attributes of SDT and Agentic theory, if not explicitly, in a nuanced and progressive manner by moderating digital harms.

The paper is organized into the following sections. In Section 2, we review the theoretical narratives underpinning both the theories in relation to self-realized choices, goal-specific activities, ethical status, autonomy and social intersubjectivity. In Section 3, we discuss epistemic discourse analysis in identifying constructs of digital harm. This section also suggests an understanding of human fulfilment that refers to individual rationality, maturity and autonomy through rationalizing reasoning and ethics. Following this, in Section 4, we present a thematic analysis based on 25 interviews to support and validate our conceptualization of digital consumption. In Section 5, we discuss how digital consumption leading to digital harm requires moderation and how our self-legitimacy can go beyond the adverse consequences of socio-technological boundaries. In this section, we develop and discuss three propositions and outline a set of policy implications. We bring our study to a close by concluding in Section 6.

2. Dominant theoretical narrative

Excessive use of digital platforms leads to a range of socio-psychological and ethical issues (Kaur et al., 2021). People are influenced so much by digital exposure that their physical and emotional well-being is severely affected (Bhargava and Velasquez, 2020; Duan et al., 2019; James et al., 2017; Jung et al., 2016). Specifically, individuals' optimal psychological functioning and experience, social connectedness, self-esteem and empathy are under threat in the digital world by excessive digital consumption (James et al., 2017). A survey by the World Economic Forum (WEF) found that excessive use of digital platforms can change human decisions and pose a risk to civil society.[2]

We develop our theoretical narrative combining SDT and Agentic theory. The two theories complement each other in various manners: (1) The core principles of both theories illustrate human choices and self-determination (Bandura, 2001, 2006, 2011a, 2011b; Deci and Ryan, 2000, 2012a, 2012b); (2) SDT explains agentic actions involving human fulfilment (i.e. socio-psychological needs

[2] https://reports.weforum.org/human-implications-of-digital-media-2016/downsides-and-risks/. Accessed on 02/03/2022.

for autonomy, determination, relatedness, ethical competence, and autonomy (Adams et al., 2017)), particularly, the extent to which our external motivations and actions are satisfied through internal rationality and maturity; and similarly (3) Agentic engagement explains our self-determination through socio-psychological needs (Bandura, 2008a, 2008b). Digital consumerism substantively affects human rationality, agentic behaviour and self-determination choices (Dette, 2018; James et al., 2017; Liu et al., 2021; Sutton, 2020). Due to their complementarity in explaining the phenomenon of human socio-psychological behaviour, we use both theories as our underpinning theoretical narrative.

2.1. Digital harm arising from excessive digital consumption: Self-determination theory

SDT implies that individuals' extrinsic and intrinsic motivations reflect their decisions that are related to external environments. SDT describes human autonomy and the effect of external control through the socio-psychological context (Deci and Ryan, 2000, 2012a, 2012b). SDT suggests that we, as humans, decide and naturally tend to combine our intrinsic motivation with external conditions for our own societal growth and well-being (Deci and Ryan, 2000, 2012a, 2012b): a condition similar to our choice to use digital means for social and personal well-being. Deci and Ryan (2000) argue that human determination can be explained by our extrinsic and intrinsic motivations. Extrinsic motivation encompasses external, introjected, identified, and integrated regulations, whereas intrinsic motivation relies on aspects of our behaviour that are inherently self-fulfilling and externally satisfying human efforts (Ryan and Deci, 2002). SDT theorizes that our intrinsic motivation functions to meet our socio-psychological needs such as autonomy, competency, relatedness, ethics, and reasoning (Burton et al., 2006; Chiu, 2021; Niemiec et al., 2010). As such, technological acceptance through digital consumption has a large bearing on human socio-psychological needs relating to our autonomy, competency, relatedness, and reasoning (Lee et al., 2015; Roca and Gagné, 2008).

SDT specifically explains these socio-psychological needs. Relatedness is our connectedness to others and helps our intention as to how we interact with others, whereas competence as our affirmative action gives us valued outcomes and leads us to self-reactiveness. Autonomy, as self-initiated and regulated behaviour, promotes our self-reflection, while ethical status and reasoning offer us foresight. Each of these SDT characteristics significantly corresponds to various attributes of Agentic

theory. Moreover, SDT supposes that our needs can be satisfied, despite differential individualistic behaviour, through the purpose of well-being (Deci and Ryan, 2000).

Autonomy is central to human emancipation and self-determination (Habermas, 1984, 1987; Kant, 1996, 1999; Zuboff, 2019). However, the autonomy that elevates human self-efficacy remains a matter of concern for political theorists, anthropological sociologists, and cognitive behaviourists. In particular, excessive digital consumerism is challenging our autonomy (Bhargava and Velasquez, 2020; Staniewski and Awruk, 2022). Autonomy in combination with an ethical purpose offers human self-determination and the choice of using optimal reasons to achieve our preferred goals (Baxter, 2011; Jacob, 2019). However, excessive digital consumption and frequent use of digital means have created a socio-economic condition where we routinely depend on assisted decision-making (Galloway, 2017), which leads us to a lack of independent choice. In contrast, our inherent autonomous reasoning is guided by technological externalities such as digital consumption and, as a result, we are under more surveillance and control (Gorton, 2016; Hansen and Flyerbom, 2015; Zuboff, 2019). Hence, excessive digital consumption, due to loss of autonomy in reasoning and decision-making, is more likely to reduce our levels of well-being.

Technological conglomerates, because of their economic and political power, control the inward and outward flow of information, compromise individuals' autonomy through surveillance and censorship, and manipulate human reasoning and ethics through purposive communication (Trittin-Ulbrich et al., 2021). Digital consumption also undermines our relatedness, communication and interaction with others by diminishing human competence related to self-belief (Legault, 2017; Underwood and Ehrenreich, 2018). This is quite opposite to the claims that digital consumption frees up individual autonomy and enhances relatedness through social networking, increases competence by providing access to extensive knowledge sources, and enhances reasoning by granting access to different viewpoints (Rogers and Mitzner, 2017). In particular, digital means can bring about high engagement with information, regulated self-disclosure, greater self-efficacy, and high-quality relationships (Beas and Salanova, 2009; Jackson et al., 2010; Turel and Serenko, 2012; Valkenburg and Peter, 2009). Thus, digital consumption can lead to contradictory viewpoints associated with individual autonomy, relatedness, competence and reasoning. However, overdependence on digital consumption

creates a strong pathological and maladaptive psychological reliance on technology (i.e. network addiction that erodes an individual's trust and reasoning) (Choi and Lim, 2016; Konana and Balasubramanian, 2005; Turel and Serenko, 2012). For example, users' subjective well-being is more likely to be affected by Facebook posts than by face-to-face communication (Choi and Toma, 2014). Besides biased comments, non-purposive interaction on networks, and social comparison, our well-being and self-identity are often affected due to addictive tendencies, such as online gaming (Liu et al., 2019), which adversely impact our moral and mental health (Panova and Lleras, 2016).

Virtual reality or augmented reality through digital means creates a sense of reality but makes us believe in false ideas of security, privacy, ethics and trust (Berkemeier et al., 2019; Fernández-Rovira et al., 2021; van Esch et al., 2019). As such, augmented reality creates a world that we find difficult to discern from reality, where the real world and digital space merge. Our autonomy and privacy are also threatened due to surveillance and monitoring. Since privacy and trust are key characteristics of our ethical identities, digital security and privacy are extremely necessary for sustaining our human moral status (Roesner et al., 2014). Moreover, lack of privacy, control, or choice makes us feel dubious about augmented reality and leads us to question our sense of reasoning (Jetter et al., 2018; van Esch et al., 2019). In this context, how user data is sold or processed has attracted much attention (Martin, 2020). Privacy and security are closely associated with our self-efficacy, ethics and trust (De Bakker et al., 2019). However, erosion of trust and violation of privacy are closely related to each other, and our ethical status and collective trust have been greatly reduced by the digital abuse that comes from digital consumption (Lowry et al., 2015). Erosion of trust can damage our relatedness with others and weaken our self-determination. In addition, our individual independent actions, self-determination and reasons play a critical role in formalizing our attitudinal and behavioural decisions (Myyry et al., 2009). Digital consumption erodes such interaction of trust between humans. Specifically, our interpersonal relationship through digital platforms makes us psychologically vulnerable due to erosion of trust and ethics and hurts our humanness, and this cannot be addressed by rules or policies (Friedman et al., 2000). For example, the effects of augmented reality have facilitated the user experience but neglected its negative roles in alienating people from reality, decreasing trust and violating privacy.

2.2. Digital harm arising from excessive digital consumption: Agentic theory

Agentic theory broadly implies that people's reasoning leads them to take actions in accordance with their moral standards. Humanness is largely guided by our moral understanding, less imposed by externalities, to lead a fulfilled life (Bandura, 2016; Deci and Ryan, 2012b; Kompa, 2016; Pinker, 2018). The process of fulfilment includes an extension of agencies through the meaning and purpose of one's life, relying on socially coordinated and interdependent efforts (Bandura, 2001, 2006, 2011a, 2011b). In particular, Agentic theory refers to human self-efficacy within the social cognitive theory, suggesting the prominent role of self-determination (Bandura, 2011a, 2011b). Bandura highlights human agency as the human capability that determines one's functioning and the outcome of actions. He proposes that through human socio-psychological self-guidance, which is similar to our social identity, one can modify and construct alternative courses of action to achieve desired outcomes, overcome societal challenges, and mitigate ethical dilemmas (Bandura, 2008a, 2008b). Human functioning is socio-psychologically driven; thus, under the influence of socio-technological advancement, humans delegate or defer their autonomy and self-determination to external agencies and largely depend on digital consumption (Scherer and Neesham, 2020). Our cognitive self-guidance depends significantly on the core properties of Agentic theory – intentionality, forethought, self-reactiveness, and self-reflection – where humans are self-organizing, proactive, self-regulating, and self-reflecting rational beings (Bandura, 2011a; 2011b). Human self-efficacy, therefore, transpires through our intentions to achieve desired goals. This, further, provides a higher degree of self-management meaningful to one's life (Bandura, 2011a). All these properties of Agentic theory can be achieved through personal, proxy and collective approaches. The adverse consequences of digital consumption affect humans either through their personal engagement or by proxy of others' engagement or can transpire through collective engagement. In particular, autonomy and self-determination through human agentic actions underpin the essence of Agentic theory (Bandura, 2011a, 2011b).

From a psychological perspective, our self-determination is linked to our social and ethical reasonings, which separate right from wrong to guide our conduct and help us to choose how we should carry ourselves (Bandura, 2006, 2011a). Applying ethical reasoning, we self-regulate ourselves and adjust our perceptions according to the socio-economic circumstances. Digital consumption, within the

context of the technological determinism proposed by Thorstein Veblen (Heilbroner, 1999), severely affects our intentionality, forethought, self-reactiveness, and self-reflection. This extends the view that our social and moral reasoning as a function of human habits is disrupted through the emergence of digital consumption (Palm and Hansson, 2006). Although digital means shape our socio-psychological and economic-cultural dimensions (Kunz, 2006), digital consumerism as an intervention adversely influences the human agencies that help us to realize our goals, reasoning, and cognitive faculties (Lee et al., 2015; Kompa, 2016). This helps us to understand from an agentic perspective how socio-moral reasonings are becoming guided by digital consumption. We cannot reflect on the limitations imposed on us by digital consumption without identifying what constitutes our moral status.

Agentic theory illustrates the purpose of interaction between several socio-psychological agents that influence the functioning of human life (Bandura, 2008). From an individual perspective, our actions and effective group performance depend on collective purpose (Bandura, 2008). However, due to the fragmented collectivism that has resulted from digital consumption, our purpose is likely to be adversely affected. Forethought refers to future-directed plans and provides reasons to motivate one's efforts (Bandura, 2008), whereas digital consumption constrains and relegates an individual's attempts at forethought. Forethought also means that agents can be self-regulators through monitoring activities (Bandura, 2008). Lack of these attributes may result in negative actions and understanding, for example, unethical behaviour and immorality. Self-reflectiveness that comes from forethought and refers to how we self-examine our human functions (Bandura, 2008). Hence, a lack of forethought, without reasoning, is highly likely to impact our self-reflectiveness adversely. A lack of these attributes is more likely to impact our moral and ethical perspectives and raise internal conflict if a self-harming choice is made (Leviston and Walker, 2020). In relation to this, conflict of human agency arises when we shift our responsibilities to others with negative consequences (Bandura, 2007; Leviston and Walker, 2020), a shift most often seen due to digital consumerism. Individuals can also engage in the moral justification of their harmful acts by assuming that they are at least better than many of their peers (Leviston and Walker, 2020). This implies, despite digital harm arising from excessive digital consumerism, that we tend to justify our actions (Bhargava and Velasquez, 2020; Palm and Hansson, 2006; Seabrook et al., 2016).

2.3 Development of the theoretical framework

We frame our dominant theoretical narratives based on SDT (Ryan and Deci, 2012a, 2012b) and Agentic theory (Bandura, 2001, 2006) and argue that excessive digital consumption can be addressed, if not explicitly, in a nuanced and progressive manner by moderating digital harms. To develop our theoretical framework, we identify and define constructs of digital harm arising from digital consumption and contextualize how digital consumerism affects the individual ethics and rationality, maturity, and autonomy that can be explained by SDT and Agentic theory, specifically the extent to which digital consumption promotes the adverse and unethical consequences of technological overdependence due to excessive digital consumerism (Gulenc and Ariturk, 2016). We comprehensively review the related literature in identifying the constructs of digital harm and their connectedness to digital consumption. SDT has been valuable in explaining the role of intrinsic and extrinsic motivational elements in individual responses (Legault, 2017) but limited in showing how these elements may drive individual behaviour related to digital consumption when they are based on contradictory beliefs and affected by the ambivalence of the inner self. By combining Agentic theory with SDT, we show how individuals can cope with internal conflicts arising from contradictory beliefs and ethics and the ambivalence of the inner self towards ethical and moral consequences (Bandura, 2002).

3. Methodological design

To offer a rich context to our narrative (Ketokivi and Mantere, 2010), rather than following the quantitative analytic tradition, we adopt qualitative epistemic discourse analysis together with thematic analysis to explore our research questions. Exploratory studies like ours particularly benefit from qualitative analysis, which provides in-depth narratives detail (Mahrt and Scharkow, 2013). Our study design is outlined in Fig. 1. Epistemic discourse analysis, as an explanatory instrument to advance and generate knowledge, has been used in several studies relating to technology, big data and digital platforms (Kitchin, 2014; Mittelstadt and Floridi, 2016; Stevens et al., 2018). Since we aim to identify and define the constructs of digital harm and advance our current understanding of digital harm,

epistemic discourse analysis is deemed ideal for this purpose. In addition, we use digital harm constructs to develop our theoretical framework underpinning SDT and Agentic theory. Further, to validate and evaluate the theoretical framework, we conduct 25 semi-structured interviews and examine participant responses using thematic analysis. Thematic analysis, particularly with qualitative data, has been used considerably within the technological and digital settings (Delgosha et al., 2021; He et al., 2020; Perannagari, K.T. and Chakrabarti, 2020; Talan et al., 2020; Tidhar and Eisenhardt, 2020). Specifically, the thematic analysis identifies interconnected patterns of constructs and produces narrative-rich insights (Delgosha et al., 2021). Therefore, we undertake thematic analysis to examine our interview-generated qualitative data related to various themes of digital harm.

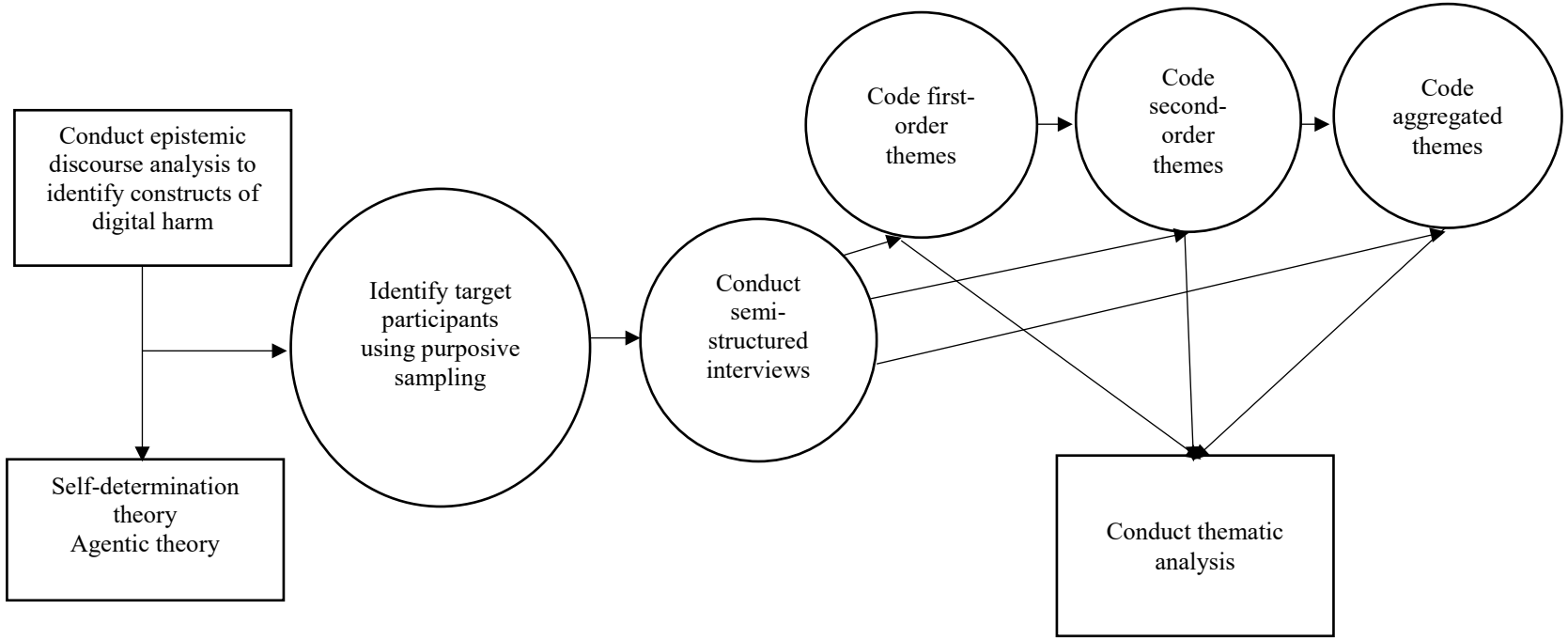


Fig. 1. Study design

3.1. Epistemic discourse analysis

Epistemic discourse analysis is concerned with the systematic and explicit study of knowledge that underscores the importance of interactively managed structure and strategies of text (Van Dijk, 2013). Specifically, epistemic discourse analysis explores and justifies the well-expressed, implied, and newly construed development of knowledge (Bogdan, 2004; Van Dijk, 2013). It also helps to communicate social attitudes, beliefs, ideologies, identifies and attributes (Van Dijk, 2013). Besides, epistemic discourse analysis can explore causality between various attributes that link to human intention, such as autonomy, desire, self-reflection, competence, reasoning, and forethought (Bogdan, 2004).

We begin by reviewing prior studies and identifying the underlying constructs of digital consumption that lead to digital harm. In line with the sequence of epistemic discourse analysis, we collect key studies based on digital consumption and digital harm, identify dominant themes and discourses, explore any evidence of an interrelationship between discourses, review counter-discourses, evaluate the effects of each discourse and, finally, contextualize the most recurring and dominant discourses (Gee, 2014; Johnson, 2014; Van Dijk, 2013). As a result, we identify five constructs – socio-psychological deficiency, augmented reality, unethicality and trust erosion, compulsive behaviour, and differentiated distance – and denote them collectively as digital harm (Table 1). The related literature for each digital harm construct is presented in Appendix A. Each construct comprises various aspects of digital harm arising from excessive digital consumption. We posit that digital consumption leads to digital harm and that the influence of digital harm (i.e., lack of: self-realized choices, goal-specific activities, autonomy, social intersubjectivity, ethics and reasoning) can be mitigated through the attributes of SDT and Agentic theory. Based on our theorization, we outline our theoretical framework underpinning SDT and Agentic theory (Fig. 2). We combine key attributes of the two theories by conceptualizing how autonomy promotes self-reflection, competence leads to self-reactiveness, relatedness improves intentionality, and reasoning offers forethought.

Socio-psychological deficiency suggests that through digital consumption, our capability for cognitive improvement and societal interaction through reasoning, mental resilience and intersubjective understanding are compromised (Gulenc and Ariturk, 2016; James et al., 2017; Kompa, 2016). Augmented reality relates to the reflection of reality and belief in this reflection, where the real world

is misrepresented by technology-enhanced virtual reality (Bhargava and Velasquez, 2020; Richards, 2013; Tegmark, 2017). Unethicality and trust erosion indicate that we perceive a reduced level of trust in our logical self and reasoning, and so instead we use digital means to guide our reasons and ethics (Martin, 2020; Scherer and Neesham, 2020; Zuboff, 2015, 2019). Compulsive behaviour highlights our overreaching tendency and dependency on digital consumption, leading to a lack of self-determination, where failing to depend on technology results in anxiety, stress, and inactivity (Karim and Chaudhri, 2012; O'Connor and Weatherall, 2019; Robbins and Clark, 2015; Scherer and Neesham, 2020). Finally, differentiated distance indicates that as humans, we no longer adhere to normative collectivism and we become socially fragmented since digital consumption has adversely affected our social patterns and expectations (Robbins and Clark, 2015; Sunstein, 2008).

Table 1. Definition of digital harm constructs

Socio-psychological deficiency	Human capability for cognitive improvement and societal interaction through reasoning, mental resilience and intersubjective understanding is compromised (Gulenc and Ariturk, 2016; James et al., 2017; Kompa, 2016).
Augmented reality	Humans merely see the reflection of reality and believe in the reflection, where the real world is misrepresented by technology-enhanced sensory modalities (Bhargava and Velasquez, 2020; Richards, 2013; Tegmark, 2017).
Unethicality and trust erosion	Humans perceive a reduced level of trust in their logical self, ethical identity and reasoning, so instead they use digital means to guide their reasons and ethics (see e.g. Martin, 2020; Scherer and Neesham, 2020; Zuboff, 2015, 2019).
Compulsive behaviour	Overreaching tendency and dependency on technology-driven digital consumption leads to a lack of self-determination, where failing to depend on technology results in anxiety, stress and inactivity (Karim and Chaudhri, 2012; O'Connor and Weatherall, 2019; Robbins and Clark, 2015; Scherer and Neesham, 2020).
Differentiated distance	Humans are no longer adhering to normative collectivism and are becoming socially fragmented since digitalized technology has disrupted our social patterns and moral expectations (Robbins and Clark, 2015; Sunstein, 2008).

Note: We identified the digital harm constructs by extensively reviewing key studies based on digital consumption and digital harm. The connotations of constructs were synthesized from the narrative and essence of the studies, rather than directly adopting their words. Each construct comprises several aspects of digital consumption and includes a number of implicit meanings relating to digital harm.

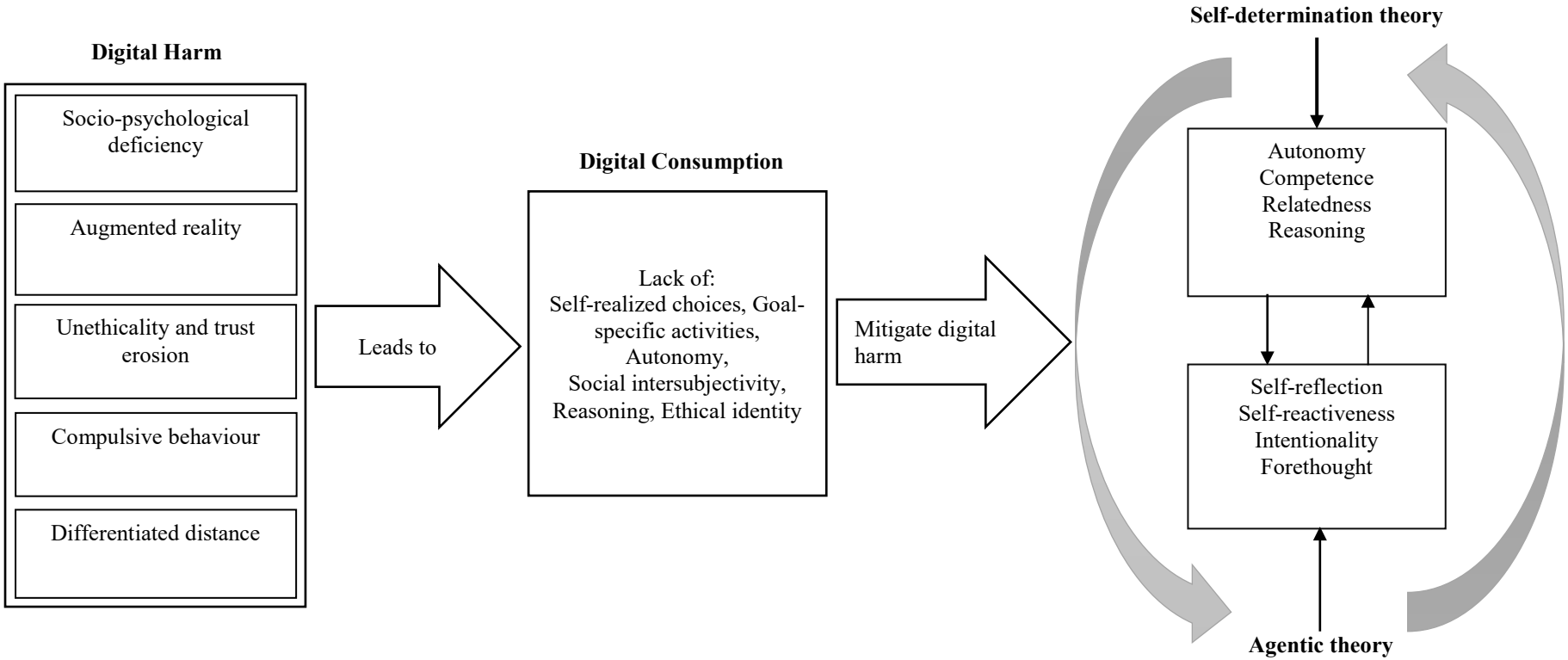


Fig. 2. Theoretical framework

Note: The proposed theoretical framework outlines constructs of digital harm arising from digital consumption, which can be mitigated using attributes of two theories: SDT and Agentic theory, such as autonomy can promote self-reflection, competence can lead to self-reactiveness, relatedness can improve intentionality, and reasoning can offer forethought.

3.2 Thematic analysis

3.2.1. Data collection and process

We take a sequential approach to data collection through semi-structured interviews and undertake thematic analysis to provide a range of perspectives on digital harm that arises due to digital consumption (Fig. 1). The semi-structured interview protocol and process are consistent with Leech (2002). In view of our theorization that excessive digital consumption leads to a condition of digital harm that can be mitigated through various attributes of SDT and Agentic theory, we conducted interviews and evaluated the extent to which the participants had experienced digital harm and mitigated its adverse effects. In total, 25 participants were purposively sampled, for a meaningful understanding of digital harm arising from digital consumption. Purposive sampling is a preferred qualitative instrument that serves a specific purpose to achieve representativeness (Teddlie and Yu, 2007). Given the nature of our exploratory inquiries, we found purposive sampling to be the ideal sample selection criterion (rather than random probabilistic sampling) (Tashakkori and Teddlie, 2003, 713). We developed four common interview questions referring to each digital harm construct, giving 20 questions in total for the interviews. The interview questions are presented in Table 2. Considering purposive sampling, the participants for our interviews were selected based on their experience as technology professionals or educators or having an active involvement in diverse technology platforms as regular digital users. Due care was taken to include participants who had used digital technology extensively (with more than 10 years of experience) and were aware of the negative impact created by digital consumption. Our sample includes CEOs, managing directors and senior executives, and researchers who are actively involved in management, education, business, and policymaking initiatives concerning the impacts of digital harm. The distribution of participants is presented in Table 3 with a graphical presentation in Fig. 3. We chose all the participants from India, and interviews were conducted with their informed consent via Skype during March to May 2021. Since India, among other emerging economies, is witnessing an increasing trend of digital consumerism (Kanungo and Gupta, 2021), we believe that our data collection from India will provide parsimonious and robust results. Following interview protocol (Milagros, 2016), participants were briefed about the purpose of the interview and the interview questions were fully explained to them prior to the interview. We ensured that the

interview questions aligned with our research enquiry, by initiating an inquiry-based conversation, receiving feedback from the interviewers, and piloting the purpose of the interview. Further, to offer clarity, the study design, textual meaning, theoretical framework, and taxonomy of questions were all explained to participants as part of the interview schedule (Leech, 2002); they were also advised that if they preferred not to participate, they could leave or ask the interviewer to stop the interview immediately. Each interview lasted for almost 45 minutes, and we recorded the interviews using Skype audio capture. Subsequently, the recorded audio contents were transcribed into text. Only one interviewer conducted all interviews to avoid any possible inter-rater bias (Kølbæk et al., 2018). Also, mismatch errors may exist when multiple coders submit their data after abstraction (Lucyk et al., 2017). Further, to ensure quality in our coding, we took a number of precautions: (1) We made sure that full detail was captured from participants' responses through the discursive exchange during the interviews, as high-quality interviews tend to be associated with in-depth details (Hermanowicz, 2002); (2) We ensured that the coder was unbiased and familiar with the research setting, that is, the study background and socio-cultural pattern of the sample (Lucyk et al., 2017); and (3) The coder reiteratively checked the codes to ensure that the coding remained consistent and, if any modification was undertaken, it was subsequently verified (Hruschka et al., 2004).

Table 2. Interview questions

Q1. To what extent do you find your individual self-autonomy (i.e., the ability to self-initiate and regulate own behaviour) promotes self-reflection (i.e. the ability to pay attention to our own thoughts, emotions, decisions and behaviours) that helps with mitigating or improving:	Q1a.	Socio-psychological deficiency
	Q1b.	Augmented reality
	Q1c.	Unethicality and trust erosion
	Q1d.	Compulsive behaviour
	Q1e.	Differentiated distance
Q2. To what extent do you find your competence (i.e. ability to take affirmative action) leads to self-reactiveness (i.e. the ability to motivate and self-regulate our own actions and monitor our goals) that helps with mitigating or improving:	Q2a.	Socio-psychological deficiency
	Q2b.	Augmented reality
	Q2c.	Unethicality and trust erosion
	Q2d.	Compulsive behaviour
	Q2e.	Differentiated distance
Q3. To what extent do you find relatedness (i.e. ability to connect with others) improves intentionality (i.e. the ability to be deliberate or purposive in choosing a course of action) that helps with mitigating or improving:	Q3a.	Socio-psychological deficiency
	Q3b.	Augmented reality
	Q3c.	Unethicality and trust erosion
	Q3d.	Compulsive behaviour
	Q3e.	Differentiated distance
Q4. To what extent do you find your reasoning (i.e. ability to think rationally, logically and sensibly) offers forethought (i.e. the ability to carefully think and plan for a future event) that helps with mitigating or improving:	Q4a.	Socio-psychological deficiency
	Q4b.	Augmented reality
	Q4c.	Unethicality and trust erosion
	Q4d.	Compulsive behaviour
	Q4e.	Differentiated distance

Note: The meanings of digital harm constructs – socio-psychological deficiency, augmented reality, unethicality and trust erosion, compulsive behaviour, and differentiated distance – were explained to the participants while interviewing them, referring to Table 1: Definition of digital harm constructs. They were also briefed, using Fig. 2: Theoretical framework, on how autonomy promotes self-reflection, competence leads to self-reactiveness, relatedness improves intentionality, and reasoning offers forethought.

Table 3. Characteristics of participants

Participant number	Gender	Age	No. of years of experience in digital usage
1	Male	38	17
2	Female	52	18
3	Male	45	23
4	Male	38	25
5	Male	51	30
6	Female	34	24
7	Male	44	25
8	Male	50	25
9	Female	55	25
10	Male	50	25
11	Male	47	25
12	Male	45	20
13	Male	40	22
14	Male	28	15
15	Male	73	35
16	Male	61	18
17	Male	25	10
18	Male	50	30
19	Female	34	15
20	Male	45	30
21	Male	48	25
22	Male	33	16
23	Male	43	20
24	Male	38	18
25	Male	33	25

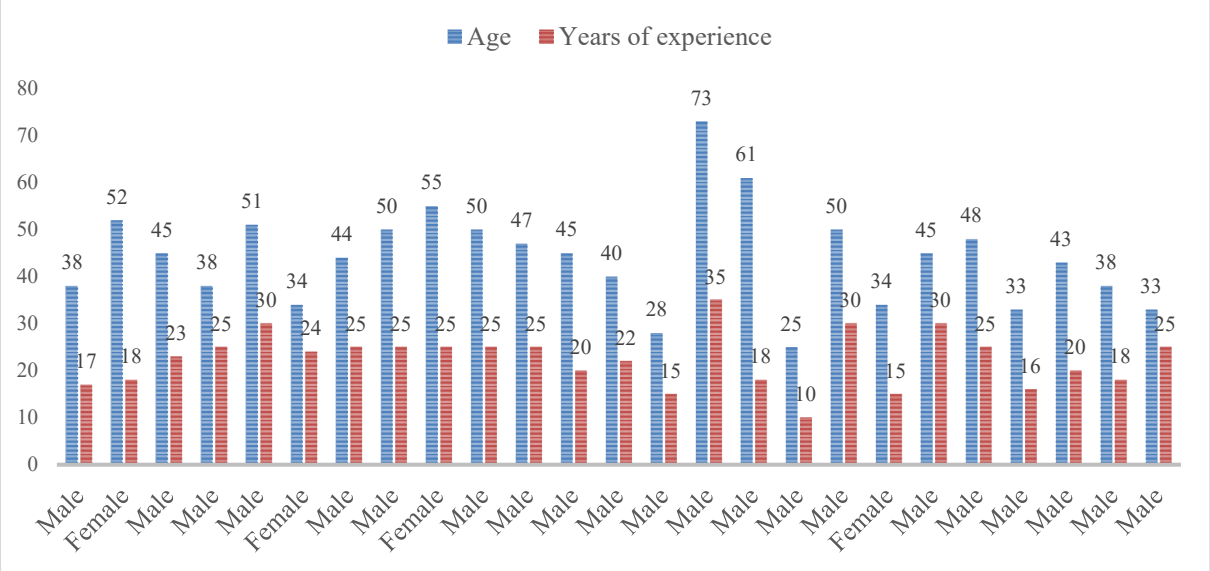


Fig. 3. Participants' age and number of years of experience in digital usage

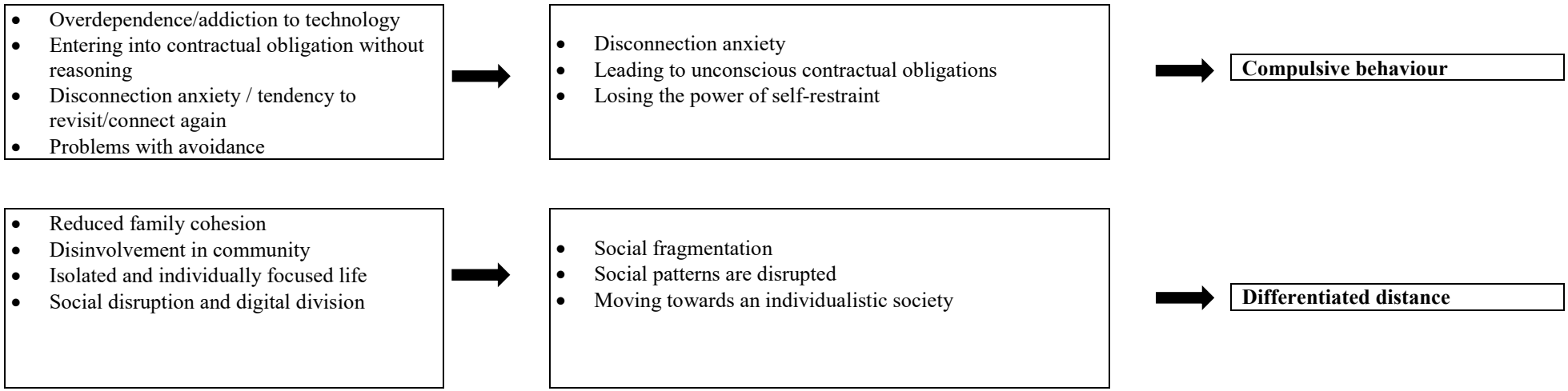
3.2.2. Data analysis

Data were analysed using a sequential iterative process that involved moving between the data and an emerging structure of corresponding themes according to six key steps of thematic analysis (Nowell et al., 2017). The first step involved familiarization with the data and in the second step initial codes were generated. The third step included classifying and collating all the relevant coded data into first-order themes around digital harm, digital consumption and mitigating strategies via open coding (Braun and Clarke, 2006; Locke, 2001). In the fourth step, we refined the first-order themes by reviewing the coded data extracted for each theme to check whether these themes appeared to form a coherent pattern (Braun and Clarke, 2006). During this step, replicability, overlapping and inadequacies in the first-order themes were examined and more refined second-order themes were generated (King, 2004). The fifth step entailed determining what aspect of the data each theme captured and the names of aggregated themes that would give readers a sense of what the theme was about (Nowell et al., 2017). The final step comprised an analysis based on a concise, coherent, logical and non-repetitive account of the data within and across the themes (Braun and Clarke, 2006). Due care was taken to clearly communicate the logical process by which findings were developed to render a piece of credible information (Thorne, 2000). Table 4 presents the first-order, second-order and aggregated themes referring to digital harm, digital consumption and mitigation of digital harm constructs underpinning SDT and Agentic theory.

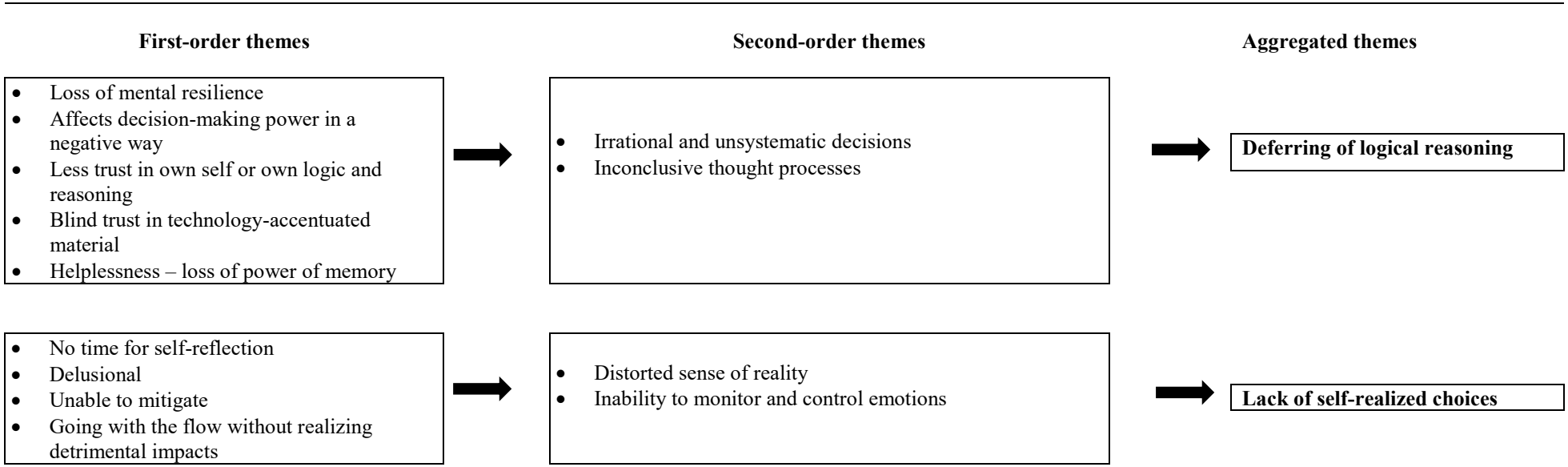
Table 4. Thematic analysis

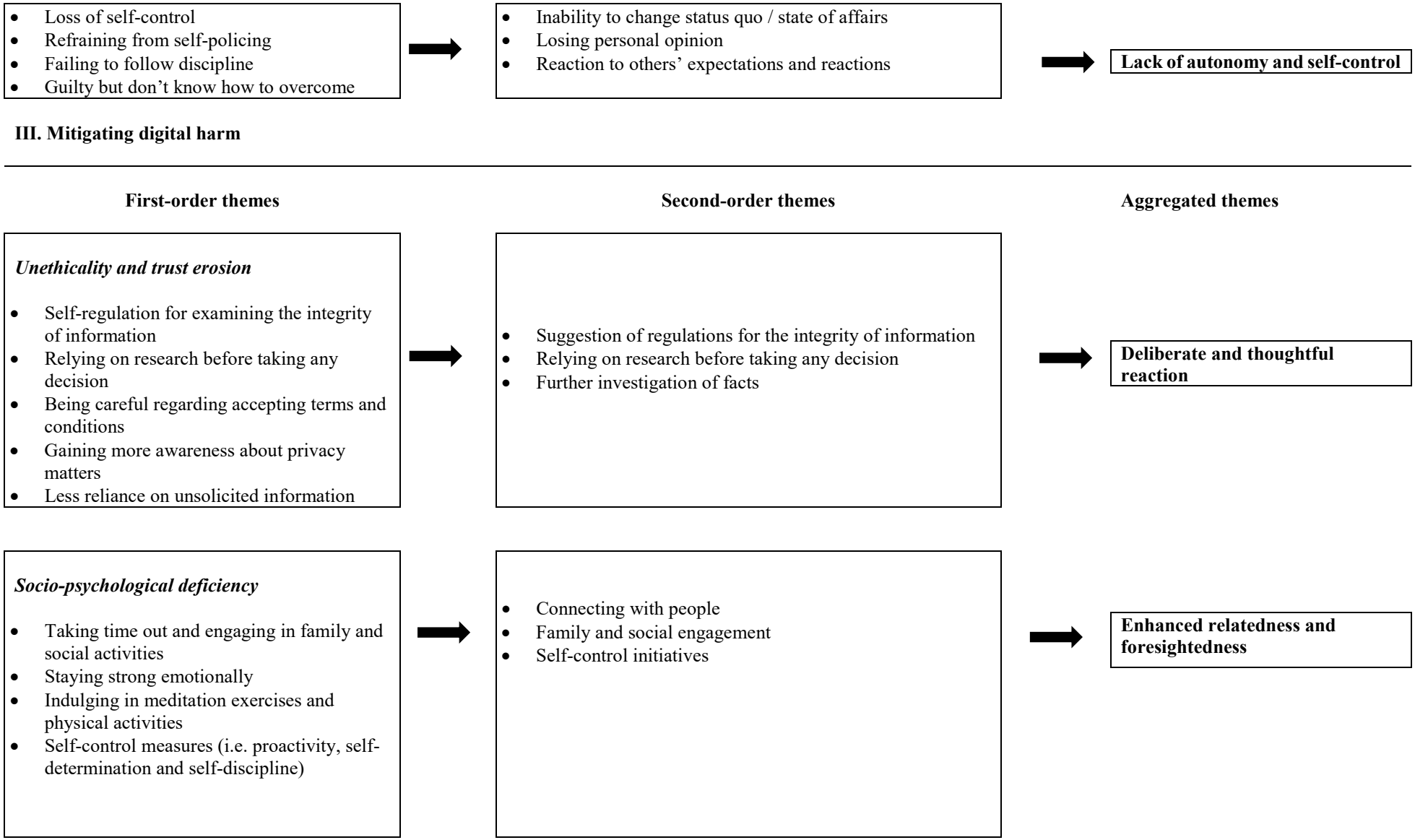
I. Digital harm constructs

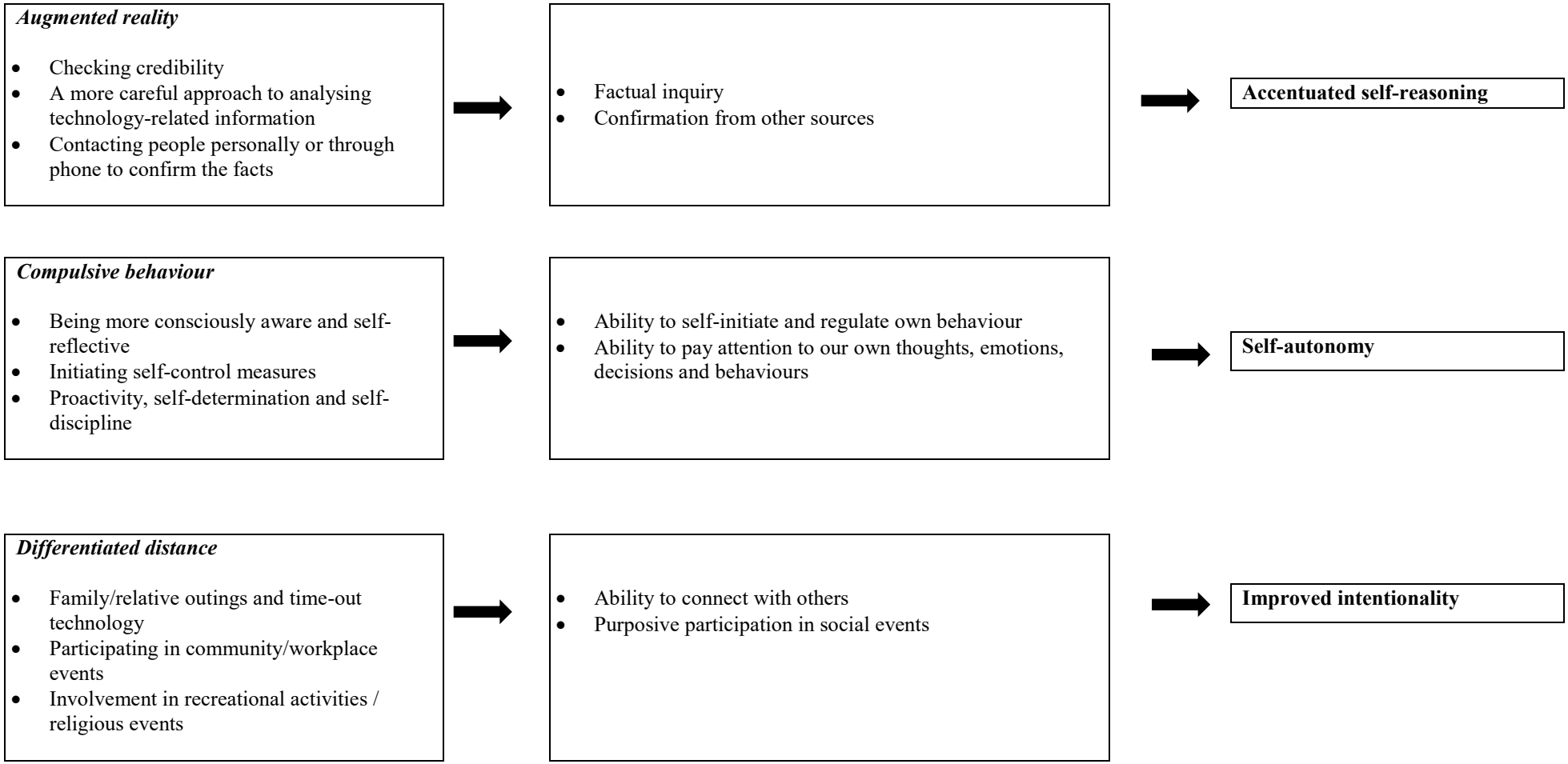
First-order themes	Second-order themes	Aggregated themes
• Disruption of social patterns and moral expectations • Superficial/projected profiles and relationships • Results in technology fatigue and impaired perceptions • Disconnection anxiety and rumination • Impact on reasoning, mental resilience and cognitive skills • Addiction to technological gadgets	• Social and psychological skills compromised • Social intersubjectivity compromised • Adverse cognitive-emotional-behavioural adverse impacts • Technology-delivered overexposure and complicated rumination	**Socio-psychological deficiency**
• Leads to misinterpretations of facts • Leads to blind trust in technology • Bombarded with distorted sensory perceptions • Humans mainly see a reflection of reality • A blurred perspective around reality and actual things	• Distorted sensory perceptions • Degree of suspicion in state of affairs • Perception distortion and distorted reflection of reality	**Augmented reality**
• Reduction and loss of privacy / fear of intrusion • Ethical, confidentiality and breach-of-trust issues • Variability in information and superficially augmented life • Suspicion about facts and information • Biased opinions and prejudices	• Loss of faith and trust in technology • Lack of trusted information and constant fear of exposure • Increase in superficial identity formulation	**Unethicality and trust erosion**



II. Digital consumption




Loss of self-control
Refraining from self-policing
Failing to follow discipline
Guilty but don't know how to overcome
Inability to change status quo / state of affairs
Losing personal opinion
Reaction to others' expectations and reactions
Lack of autonomy and self-control
III. Mitigating digital harm
First-order themes
Second-order themes
Aggregated themes
Unethicality and trust erosion
Self-regulation for examining the integrity of information
Relying on research before taking any decision
Being careful regarding accepting terms and conditions
Gaining more awareness about privacy matters
Less reliance on unsolicited information
Suggestion of regulations for the integrity of information
Relying on research before taking any decision
Further investigation of facts
Deliberate and thoughtful reaction
Socio-psychological deficiency
Taking time out and engaging in family and social activities
Staying strong emotionally
Indulging in meditation exercises and physical activities
Self-control measures (i.e. proactivity, self-determination and self-discipline)
Connecting with people
Family and social engagement
Self-control initiatives
Enhanced relatedness and foresightedness


Augmented reality
Checking credibility
A more careful approach to analysing technology-related information
Contacting people personally or through phone to confirm the facts
Factual inquiry
Confirmation from other sources
Accentuated self-reasoning
Compulsive behaviour
Being more consciously aware and self-reflective
Initiating self-control measures
Proactivity, self-determination and self-discipline
Ability to self-initiate and regulate own behaviour
Ability to pay attention to our own thoughts, emotions, decisions and behaviours
Self-autonomy
Differentiated distance
Family/relative outings and time-out technology
Participating in community/workplace events
Involvement in recreational activities / religious events
Ability to connect with others
Purposive participation in social events
Improved intentionality

4. Results from the thematic analysis

4.1 Digital harm

Based on epistemic discourse analysis, we identified and categorized five constructs of digital harm arising from digital consumption: socio-psychological deficiency, augmented reality, unethicality and trust erosion, compulsive behaviour, and differentiated distance. Further, we conducted a thematic analysis to examine the effects of these constructs within our theoretical framework, using the responses from semi-structured interviews. The following subsections present the thematic analysis results.

4.1.2 Socio-psychological deficiency

Socio-psychological deficiency emerges primarily from compromised social and psychological skills, social intersubjectivity and cognitive-emotional behaviour, due to overexposure to digital consumption and complicated meditation (Kaur et al., 2021). Prior studies have underlined the extent to which cognitive improvement and societal interaction through reasoning have been affected in recent years, with mental resilience and intersubjective understanding being compromised due to exposure to digital consumption (Gulenc and Ariturk, 2016; James et al., 2017; Kompa, 2016; Phillips, 2008; Zhou et al., 2021). The technological surge and digital consumption have disrupted the social pattern and ethical expectations, with most people drawing themselves into isolation and becoming superficial, since their conscious actions are based on social intersubjectivity. The following quotes by participants 5 and 17 confirm this:

> *Not being able to feel the need of having a big social circle because I'm quite happy with being on my own and not having to go in bars or pubs or going out with my friends and things like that. (Participant 5)*

> *With more and more time, I am conscious about what others perceive about me and I am more influenced by the comments, views and opinions of others. Sometimes, I feel that I am projecting in agreement with others and have lost my true sense of being. (Participant 17)*

Similarly, digital consumption has caused adverse cognitive-emotional-behavioural impacts (i.e. disconnectedness, anxiety, addiction, rumination), which have resulted in the distortion of mental reasoning and resilience. The following quote sums up the disconnectedness and anxiety of one participant:

I charge my mobile phone constantly to be connected 24/7. I have a fear of feeling disconnected from the world. I know it is time to sleep, and I should be sleeping, but I would constantly find the urge to quickly check if there is any email, or I would spend some time watching some YouTube videos, then I sleep late, and then I get up late feeling technology fatigue. (Participant 8)

4.1.2 Augmented reality

Overdependence on digital consumption and frequent reliance on technology create an augmented reality or virtual reality that distorts our real being, creating a virtual 'sense of being' (Herz and Rauschnabel, 2019). The participants reported that they often felt a perception of distortion due to information overflow from different sources adversely affecting their perception. Moreover, they perceived that blind trust in digital consumption had led them to perceive a reflection of reality, and they more often felt that they had developed a blurred perspective of actual things that trigger suspicion, as well as a distorted reflection of reality. We, therefore, observe that over-reliance on technological means (i.e. digital devices) has compromised reality and often the real world is misrepresented by technology-enhanced virtual reality. The observations of Participant 21 follow:

I think we live in a generation where we can't differentiate between augmented reality and the actual reality because, you know, I grew up in a time where I never actually used any kind of computer or any kind of device. So, the reality that I got exposed to while growing up was a different reality than growing up in these days, as virtual reality intervenes the perception of what reality is. (Participant 21)

4.1.3 Unethicality and trust erosion

Unethicality and trust erosion relate to participants' declining level of trust in technology, which compromises their ethical status, the basis of confidentiality and their ethical self (Julsrud and Krogstad, 2020). Most participants reported that usage and digital consumption had impacted their ethical self and reasoning, resulting in a lack of trust in information, integrity of facts, and veracity of sources. As a consequence, biased opinions and prejudices due to imposed digital identity had eroded their trust and affected their ethics. For example, one of the participants observed that in this technological era, Google is seen as omniscient and that has created a trust illusion, taking over the logical reasoning of individuals, where people reason without the guidance of intersubjectivity. Moreover, many participants expressed concern over persistent fake news, breaches of trust due to the overbearing intrusion of

companies in their private life, and fraudulent and unethical practices due to technological intervention. The following quote from a participant reflects these concerns:

> *There is a plethora of fake news, and it becomes very difficult to distinguish the accurate facts and fake news, and that results in losing trust in technology. We don't know who is uploading them, whether that source is reliable or not or who approved that! I think this kind of breaches trust, as many times it has happened that many payments are deducted from my account without my knowledge. (Participant 4)*

4.1.4 Compulsive behaviour

Compulsive behaviour is rooted in the overreaching tendency of digital consumption (Tandon et al., 2022). In particular, the dependency of participants on technology-driven digital means leads to anxiety, entry into unconscious contractual obligations affecting ethics, and loss of the power of self-restraint. Most participants felt that digital consumption had become an indispensable part of their lives and that, in a way, it has become a necessity for every professional and individual because of socio-normative requirements. This has resulted in disconnectedness and anxiety, where people feel distressed if they can't access their digital devices. They are unconsciously addicted to digital consumption and there is a constant urge to check or switch on technology-assisted devices. For example, one of the participants observed that even when he went to sleep, there was an urge to check emails, WhatsApp messages or YouTube videos; he was aware that 99% of the material he saw on WhatsApp and YouTube was garbage, but he had not been able to overcome his compulsion. The following comments are from another participant:

> *One of the things that happens with me, sometimes, is that at night when I'm sleeping even, and I when I know that this is time to sleep, I would unconsciously pick up my phone to check my email and check my WhatsApp messages. Yes, yes, absolutely that has happened to me a lot of times, yes, I want to check my phone every 10 minutes, see who's messaged me or at night when I've had some silence after my child is asleep. (Participant 11)*

Some of the participants referred to compulsive behaviour that arises due to overindulgent digital consumption when digital platforms ask them to recognize contractual obligations required to use the platforms. They mentioned that initially they used to be particular about reading all the terms and conditions, but now they have become immune, ignoring the minute details of the terms and conditions and compulsively accepting them.

4.1.5 Differentiated distance

Most participants noted that digital consumption is moving our society in the direction of an individualistic society that is structurally fragmented. Unlike in a living, cognitive society, our societal patterns are disturbed and disrupted due to excessive use of technology (Veitas and Weinbaum, 2017). Participant 17 observed that our expectations of fellow members of society have gone down, due to excessive digital consumption that has disconnected people from normative collective practice. Even in a social gathering, instead of interacting with each other, people are absorbed in or using their digital devices. The following is the observation of Participant 19 concerning differentiated distance:

> *Online superficial interaction has increased but there is a lack of interaction with real people. I mean face-to-face interaction has reduced a lot, so the interactions in a way have become superficial, not real, and you can always feel the distantness of relationships. (Participant 19)*

4.2 Digital consumption and overdependence

We further our enquiry to explore the extent to which digital harm contributes to digital overdependence, that is, the deferring of logical reasoning, lack of self-realized choices, and lack of autonomy and self-control. Broadly defined, such overdependence refers to the erosion of an individual's reasoning and self-control due to digital consumption (Scherer and Neesham, 2020). In line with our argument, we formalize the following three themes emerging from the interviews.

4.2.1 Deferring of logical reasoning

Almost all the participants agreed that exposure to digital consumption and our over-reliance on technological means have led to a deterioration of our mental resilience and caused erosion in our logic and reasoning. Digital consumption has created a condition where our self-affiliated reasons are guided without each other, making us more socio-technological beings (Hajiheydari et al., 2021). Most of the time this results in irrational and unsystematic decisions but sometimes in unethical behaviour. The following was observed by one participant:

> *I think I have lost the capability of reasoning and logic. I feel that technology-assisted social media technology has snatched from me what I can still think and reason, the positive and negatives. It has numbed my power of reasoning to some extent, and I deliberately defer the conscious reasoning process and go on increasing different platforms. (Participant 2)*

4.2.2 Lack of self-realized choices

The participants also shared that they were so absorbed and involved with digital consumption that there was no time for self-reflection. The overpowering presence of technology had led them to accept technology-assisted means in their personal and social lives (Kaur et al., 2021; Tandon et al., 2022). Even though they did understand and realize the detrimental effects of digital consumption on their well-being, they were unable to mitigate the negative impacts by limiting themselves. Participant 21 observed a lack of self-realized choices as follows:

> *When I look at the balance sheet, whether social media has created more positives or negatives … I do understand there are more negatives in terms of self-absorption or disintegrating from social life. But strangely enough, despite this realization, I am puzzled that I lack choices to curb this detrimental behaviour. (Participant 21)*

4.2.3. Lack of autonomy and self-control

There was a clear sense of agreement among participants' observations regarding loss of autonomy and self-control concerning digital consumption. Most of the participants mentioned that they had initiated some sort of self-discipline but failed miserably, and any disciplinary efforts to curb digital consumption had not been successful. The failure to do so had inculcated among them a sense of inability to change the status quo and the fear of losing the value of their personal opinions regarding self-autonomy (Dhir et al., 2022). The following are observations from Participant 16:

> *I thought that I will keep my phone out of my bedroom at night. Am I able to do it? No, I tried. But I am not able to do that. I am hoping that I will succeed one day, but to date no success. And what is the excuse I'm giving to myself, you know… that I have an alarm on my phone. So, I need to have a phone around me, or maybe if my dad calls, I don't want to miss it. (Participant 16)*

4.3 Mitigating digital harm

Given the various types of digital harm that had affected the participants and led them to a condition of technological overdependence, we explored further, to understand how participants had mitigated the effects of digital harm following the attributes of SDT and Agentic theory. The participants noted the following five mitigation strategies.

4.3.1 Deliberate and thoughtful reaction

One of the ways in which participants had mitigated the harmful effects of digital consumption was through adopting deliberate and thoughtful reactions, ethical standards and logical reasoning. This included exercising self-regulation and reflection by reducing overdependence on technology (Kaur et al., 2021; Veitas et al., 2017). For example, participants mentioned that to reduce digital consumption, they had to make a conscious effort to spend time away from technology, for example not engaging with any digital means for a few hours during the day. Similarly, they were also careful when sourcing information, taking decisions and constructively actuating them to avoid ethical issues. The following quotes from two participants validate these sentiments:

> *The way I have overcome technology is that I make sure that I don't spend too much time on it. I don't use social media; I am not on Twitter, and I only use Facebook a few times. If I am performing any tasks like calculating, I try to do it by myself instead of using a calculator. So, I rely on technology as little as I can and that's how I overcome its influence. (Participant 24)*

> *Technology has become such an integral part of our life and it is so difficult to take it out and think differently, but it is not impossible to do so. Being a professional, I do refer to things online when I am using the Internet, but I don't necessarily subscribe to all the things and do try to find the original source of the information so as to cross-validate the information to the original source and compare it with the contrasting information to ensure that I am getting the right information. (Participant 23)*

Similarly, several participants spoke at great length about the importance of gaining awareness when it came to protecting the ethical sides of privacy when using technology (Cloarec, 2020). For example, several participants mentioned that they were mindful of the information they are sharing online when using social media or downloading apps from mobile/tablet devices and how that information would be used. This was mentioned by Participant 17:

> *I don't like to share my details on social media. I really value my privacy and I like to keep my personal space, as I feel that nowadays people share a lot of their personal details on social media. Of course, if they find the need to share, it's up to them. However, I also feel that this exposes you to everyone and people know a lot more about you and this can lead to unpleasant incidents of crime, like online stalking and cyberbullying. (Participant 17)*

4.3.2 Enhanced relatedness and foresight

Most participants highlighted the importance of enhanced social relatedness and foresight when it came to mitigating digital harm. For example, many participants were of the opinion that despite Covid-19 impacting their digital engagement during these difficult and uncertain times (Modgil et al., 2022), they had made sure to take out time for their family and relatives by engaging themselves in physical and social activities, where possible. This had allowed them to use technology constructively to mitigate the harmful effects of digital consumption to a greater extent. One of the participants said the following in support of this argument:

> *At times it does get difficult, as it's really difficult to meet your friends nowadays due to the coronavirus pandemic. So, one of the ways through which I try and connect with my friends is through virtual means as I see that as one of the positive benefits of technology. For example, I use Skype and Zoom to stay connected with my friends. But yes, the ability to not always be able to meet your friends and relatives physically is a negative aspect and so I do agree that there is some degree of social fragmentation due to technology. (Participant 22)*

The participants also highlighted the importance of forethought, which can be practised through self-engagement and intersubjective understanding. Participants further indicated that by being proactive and maintaining self-control through determination and discipline, one can mitigate digital harm. This was expressed by a participant as follows:

> *The way I control my dependency on technology is through meditation and being consciously aware about my own behaviours, so, emotional intelligence, you can say, is one way which helps me to be aware about my surroundings and knowing my limitations when I am interacting with technology, and once I know this then I can mitigate its harmful effects. (Participant 1)*

4.3.3 Accentuated self-reasoning

The dominant mitigation approach that participants had adopted, which emerged as a central theme from the interviews, was to accentuate self-reasoning through validation of information received through digital means and digital consumption (Lowry et al., 2015; Myyry et al., 2009). In particular, participants emphasized the importance of verifying the authenticity and checking the credibility of information through more intersubjective human interaction:

You know there is a proverb which says 'think before you speak', although now it has changed to 'google before you speak', and so I do a lot of googling for personal and professional reasons; however, I do not believe that I trust every piece of information that I take from Google. (Participant 3)

Interestingly, participants also mentioned that the tendency to cross-check facts and information was more prevalent in people from older generations, compared with millennials who did not worry much about the ethical aspects of privacy and were more comfortable sourcing information online without much discrimination. Many of the participants expressed this sentiment when talking about how they mitigated digital harm. For example, Participants 3 and 4 said:

We are from a generation where we used to read books you see. I still read books, but I have seen that the younger generation are more interested in just listening to audio blogs and podcasts or watching videos on YouTube. They also follow others blindly on social media and don't care that much about privacy, which can be detrimental for them. (Participant 3)

I think I am not from this generation. I am a little bit older and did not grow up around much of the technology we see today and so, naturally, I am apprehensive about how I use technology and the information I share on it. (Participant 4)

4.3.4 Self-autonomy

One of the key important mitigation approaches as reported by participants was to exercise self-autonomy. Most participants reported that self-regulating one's behaviour and paying attention to one's own thoughts, rationalizing emotions and practising self-reflective intention around digital consumption were the best ways to overcome its negative and harmful effects (Tandon et al., 2022). To do this, participants suggested building awareness and demonstrating self-reflection and self-control, including discipline. They further indicated that they should be proactive and self-determined when engaging with technology, to improve relatedness with others (James et al., 2017), as explained in these quotes:

One of the things that I am trying to do nowadays is to detach myself from any electronic device like my mobile and I am going back to doing how people used to do things when there was no technology. Like, instead of using a tablet, I would use a radio and make a deliberate effort to not use any smart device. (Participant 5)

I don't trust technology easily. Of course, I use it and have to rely on technology to find information, like using Google to obtain information, but I make sure that I don't just blindly trust that information unless it is reliable. I also try to separate myself from technology and make more effort to spend time with family, so my social life is not connected to technology. (Participant 7)

4.3.5 Improved intentionality

The ability to connect with others and to have a life with purposeful meanings emerged as the final mitigation approach suggested by participants. Although participants agreed that digital consumption had a major impact on their normative collectivism and disrupted their social patterns and their ethical, as well as moral, expectations, they also emphasized the need for more effort to restore their social life by spending time with family, participating in community and workplace events, and getting involved in other religious and social events and recreational activities. Participants 11 and 2 confirmed this approach:

> *What I have observed these days is that people live in isolation, and they don't have much physical interaction, as they would prefer to chat online than talk face-to-face. You will see people sitting, but they are constantly looking at their screen and the kids don't do much physical activity. So, what my wife and I have done to mitigate this is we occasionally organize parties where we invite our friends and neighbours and we also invite their kids so that we can all physically interact and the kids can play with other kids, and this has certainly helped us to some extent in mitigating technology's harmful effects. (Participant 11)*

> *I think what we really need is some discipline because we are constantly using technology for our work, and work is never ending. Even if you spend 24 hours a day working on your computer, still that work will not finish. This is where you need to tell yourself and you need to take out time for family, time for friends and put some boundaries in place. Even though it is not easy to be organized and disciplined, it is the only way to limit technology's negative effect. (Participant 2)*

5. Discussion

5.1 Reflection on literature and theory development along with associated research propositions

Over recent decades, the socio-psychological and technological conditions driven by digital consumption have evolved and flourished, bringing unprecedented changes to our society and influencing us as normative, collective human beings.[3] As a result, our socio-normative strengths and weakness have been fundamentally influenced (Kaur et al., 2021; Tandon et al., 2022; Veitas and Weinbaum, 2019). As technologies advance and our exposure to digital consumption increases, our

[3] For instance, over 50% of adolescents in the United States (US) engage with others through online platforms e.g., on Facebook or similar digital media (Anderson and Jiang, 2018) and digital platforms are becoming increasingly central to the socio-emotional development of young adults (O'Keefe and Clarke-Pearson, 2011).

practices change, leading us to face a complex system of socio-normative interactions (Baek et al., 2013; Seabrook et al., 2016). As a consequence, our self-efficacy and liberties are compromised, intersubjective understandings are questioned, ethical values are affected, and the logical processes of reasoning are constrained. Contrary to technological progress, we are witnessing a societal condition that lacks self-determination and experiences less fulfilment, a challenge we face in being human in an era of digital consumption (Tegmark, 2017). The emergence of these new behaviours, practices and norms has concerned us through surveillance and control, both physical and unseen (Zuboff, 2019). Thus, when we deliberately or implicitly defer or delegate our self-preserving autonomy, reasoning, ideologies, and moral status to socio-technological systems or authorities, a condition of overdependence results from this digital consumption. As individuals, we experience a socio-psychological deficiency, unethicality and trust erosion, compulsive behaviour, and differentiated distance as digital harms due to excessive digital consumption. However, the literature is fragmented and inconclusive regarding the digital harms that arise from excessive digital consumption and how to mitigate them (Aladwani and Almarzouq, 2016; Baek et al., 2013; Seabrook et al., 2016; Staniewski and Awruk, 2022; Tan et al., 2021; Wilson et al., 2012). Therefore, we have developed the following three propositions consistent with our research questions:

P1: Digital harm arises from excessive digital consumption

Digital consumption has led to several socio-psychological behavioural conditions. Such behaviours trigger actions that are unintentional, uncontrollable, and compulsive, when we interact with a specific technology (Clements and Boyle, 2018). For example, algorithm-based voice assistants may result in exclusionary behaviour and poor consumer choices (Rabassa, 2022). Technological exposure leads us to addictive and compulsive dependencies (Clements and Boyle, 2018), while compulsive behaviour has a substantial negative impact on our self-esteem and self-determination. For example, anxiety associated with social media use has a significant negative influence on self-esteem (Aladwani and Almarzouq, 2016; Staniewski and Awruk, 2022. Socio-psychological features of compulsive behaviour include lack of control, anxiety in social interaction, materialism, and the need for touch, and these are all connected to the use of technological tools (Lee et al., 2014). All these features can be classified as

digital harm arising from digital consumption, which illustrates a lack of self-realized choices and a lack of autonomy, ethics and reasoning.

Digital consumption has made human culture and practices segmented and led to a situation where normative collectivism is redefined and the social model and moral wishes are modified (Myyry et al., 2009; Rogers and Mitzner, 2017). Digital consumption has also intensified political fragmentation and polarization (DiMaggio et al., 2001). Technology has caused cultural fragmentation, alienating people and groups due to the way different groups perceive, interact and reason between themselves under the influence of digital consumption (DiMaggio et al., 2001). Social intervention facilitates human decisions through the process of interaction (Kenrick et al., 2003); similarly, ideas, conventions, values, ideologies, and social beliefs drive human behaviour that is achieved through interaction and exchanges (Hajli, 2014; Leonardi and Barley, 2008). As such, the fragmented culture and distance that arise from the lack of manifestation of collectivism (Kappos and Rivard, 2008) initiate behavioural ambiguity. People's actions, reactions, and the results of ambiguous interpretations conflict with their expectations of self-reasoning, ethics and socio-psychological identity. These manifestations due to excessive digital consumption consist of socio-psychological deficiency, trust in virtual reality, unethicality and trust erosion, compulsive behaviour, and differentiated social relationships as implicit conditions of digital harm.

> *P2: SDT and Agentic theory explain the extent to which individual rationality, maturity, ethics and autonomy are affected by digital consumption.*

SDT frames socio-psychological conditions by referring to extrinsic and intrinsic motivation as underlying human reasons that help us to carry out self-realized choices, goal-specific activities, autonomy, social intersubjectivity, and ethical and rational reasoning (Gagné and Deci, 2005). Digital consumption largely influences our socio-psychological conditions, offering us functional convenience, while at the same time depleting our self-realized choices of undertaking activities that we otherwise would have undertaken without input from the digital intervention (Kaur et al., 2021; Tandon et al., 2022). Whereas our intrinsic motivation promotes our autonomy, ethical position and rational reasoning with self-determination, our extrinsic motivation relates to immediate external engagement through

regulations, interobjectivity, and self-identification. In contrast, Agentic theory centres around self-efficacy and determination. Excessive digital consumption suggests a negative relationship between self-efficacy and socio-normative and psychological well-being (Beas and Salanova 2009). Virtual communities and social networks often lead to illusions of knowledge, which could falsify people's self-esteem and discourage positive opinions about their own capabilities and reasoning (Konana and Balasubramanian, 2005). Such self-attribution biases arising from digital consumption can result in negative sentiments about decisions and unfavourable outcomes (Konana and Balasubramanian, 2005). Excessive digital consumption weakens the intentionality and sensibility of users, and their senses become distressed. Intentionality associated with relatedness affects individuals, leading them to excessive digital consumption. As such, ethical issues and digital risks are correlated (Tan et al., 2021). Our intentionality associated with relatedness refers to agentic actions and self-determination, consistent with SDT and Agentic theory. Several studies have identified the correlation between different aspects of digital harm arising through digital consumption and the socio-normative and psychological deficiency (Beas and Salanova, 2009; Choi and Toma, 2014; Choi and Lim, 2016; Hayes et al., 2015; Jackson et al., 2010; Konana and Balasubramanian, 2005; Liu et al., 2019; Panova and Lleras, 2016; Turel and Serenko, 2012; Valkenburg and Peter, 2009). A key theme of these studies refers to how digital harm can influence our levels of socio-normative and psychological deficiency through digital means affecting our well-being, mental health, ethical status, and erosion of self-concept and/or self-esteem. Similarly, a corpus of literature indicates the extent to which different attributes of augmented reality, unethicality and trust erosion, compulsive behaviour and differentiated distance create technological overdependence through excessive digital consumption (Aladwani and Almarzouq, 2016; Berkemeier et al., 2019; Clements and Boyle, 2018; Friedman et al., 2000; Jetter et al., 2018; Kaplan and Tripsas, 2008; Kappos and Rivard, 2008; Kenrick et al., 2003; Lee et al., 2014; Leonardi and Barley, 2008; Lowry et al., 2015; Martin, 2020; Myyry et al., 2009; Roesner et al., 2014; Turel et al., 2011; van Esch et al., 2019). In essence, SDT helps to interpret people's actions through self-determination, whereas Agentic theory enables us to understand individuals' behaviour from socio-normative perspectives (i.e. rationality, maturity, ethics and autonomy).

P3: The attributes of SDT and Agentic theory can help in developing a cohesive solution to mitigate digital harm.

With digital intrusion and digital consumerism, we face several compelling questions: Are we becoming more disillusioned, and is our self-legitimacy is declining? (Zuboff, 2019); Is human emancipation from excessive digital consumption possible? (Gulenc and Ariturk, 2016); Is digital consumption through technological determinism becoming an instrument for exploitation? (Fuchs, 2019); and Can reasoning and humanism bring enlightenment and positive freedom (Pinker, 2018; Scherer and Neesham, 2020) without digital consumption? However, addressing all these questions remains challenging.

Broadly defined, our self-determination and autonomy make us govern ourselves, deliberate with reasons, and consider conditions that are not externally imposed but are the extension of our conscious self. Sociologist Jürgen Habermas extended the intersubjective approach of autonomy and human spirit using psychological theory and identifying the fundamental socio-normative and psychological competencies that are not different from our cognitive faculty in relation to our social and ethical identities (Kompa, 2016; Monroe, 2009). However, current digital consumerism is adversely affecting our reasoning, reality, ethics, trust, behaviour and connectedness by prompting us to delegate our reasoning to technology-assisted means without self-determination. This condition of digital consumerism leads us to paternalistic interventions in our lives (Dworkin, 1988, 121–129), imposing one reason on us without the guidance of another reason, thus leading to belief in virtual reality, unethicality, trust erosion, compulsive behaviour and disruptive relations. Thus, a condition of socio-normative vulnerability prevails as a consequence of digital advancement (Scherer and Neesham, 2020): a situation where every person's autonomy is impacted by surveillance and control, erosion of trust, monitoring and virtual reality (Bradshaw and Howard, 2018; de Jonquières, 2017; Eatwell and Goodwin, 2018). Thus, social institutions are becoming fundamentally restraining rather than liberating for human enlightenment, efficacy and self-determination (Tegmark, 2017), and we are encountering constraints on our human fulfilment (Zuboff, 2019). Both SDT and Agentic theory have underlying attributes that can mitigate the adverse effects of digital harm. We find that attributes of both theories can complement each other in mitigating digital harm: for example, autonomy can promote self-

reflection, competence can lead us to self-reactiveness, relatedness can improve our intentionality, and reasoning can offer forethought.

5.2 Contributions to research

Our study has made three original and substantive contributions to the literature. First, we identified five underlying constructs of digital harm arising from excessive digital consumption. In contrast, studies attempting to establish a link between digital use and psychological harm have either been inconclusive or shown extremely small effects (Sutton, 2020). As technologies evolve, we, as socio-normative individuals, face the disruptive and adverse effects of digital harm. Such disruptive effects make us socio-psychologically vulnerable. As such technologies are rapidly evolving and leading us to digital overdependence, our socio-normative lifestyles are becoming excessively reliant on digital means (Coccia, 2019; Sutton, 2020). Moreover, the consequences of excessive digital consumption and technology failure can be disastrous, if not lethal (Dette, 2018). We showed that such overdependence on digital consumption results in digital harm. Unlike prior studies, through epistemic discourse, our study has articulated and defined constructs of digital harm in a systematic and cohesive way, setting precedence for digital studies. Specifically, we have advanced the conceptual boundaries of technological determinism and illustrated the dark sides of digital consumption.

Second, contrary to social psychologists' view of linear and unidirectional theories of digital acculturation – the notion that the flow of digital harm is monotonic and unidimensional (Cleveland and Bartsch, 2019) – we demonstrated that digital harm arising from excessive digital consumption is multidimensional and embedded in our socio-normative determinism. Our study lends credence to the view that digital harms trigger a lack of various attributes: self-realized choices, goal-specific activities, autonomy, social intersubjectivity, reasoning and ethical identity. We have shown that SDT and Agentic theory can explain our digital consumerism from socio-normative perspectives (i.e., rationality, maturity, ethics and autonomy). Despite digital consumption becoming increasingly pervasive and governing our socio-normative practices, human agencies can moderate its adverse effects.

Finally, our study highlighted several responses from a panel of diverse digital consumers to account for the mechanisms of the emergence of digital harms. We showed that attributes of both SDT and Agentic theory complement each other: i.e. autonomy can promote self-reflection, competence can lead us to self-reactiveness, relatedness can improve our intentionality, and reasoning can offer forethought. Our study suggests that such attributes can substantially mitigate the tendency towards excessive digital consumption and mitigate digital harms. Thus, we have made significant contributions to socio-psychological studies (Baek et al., 2013; Seabrook et al., 2016; Wilson et al., 2012) and technological-ethical studies (Aladwani and Almarzouq, 2016; Staniewski and Awruk, 2022; Tan et al., 2021) within the digital technology literature.

5.3 Practical implications

Our study offers three substantive practical implications. First, at the socio-normative level, we have provided suggestive evidence that our society, with collective efforts, can generate greater awareness regarding the harmful effects of digital consumption that are compromising our socio-psychological well-being. Thus, being aware of the adverse and detrimental effects of digital consumption (i.e. rising incidence of cyberbullying, fear of missing out (FOMO), isolation, chronic depression and anxiety, disruptive behavioural patterns in children and fragmented social life) is particularly necessary (O'Reilly et al., 2018). The impact of such adverse and detrimental effects can be mitigated using attributes of SDT and Agentic theory. Specifically, with better self-realization, responsible agentic action, accountable relationships, and effective discipline, the detrimental effects of digital harm can be addressed. This is likely to restrain our ability to use digital means in a harmful and negative way. Simultaneously, this will extend our understanding as to how to redefine our socio-normative practices.

Second, this study revealed that our self-determination and agentic actions can help us to achieve self-preserving rationality through self-reflection and forethought when facing digital harms. This is consistent with SDT and Agentic theory, which further illustrates the significance of human agency within the institutional and governance framework. Fundamentally, the human agency can be exercised through intermediation by collective agencies (e.g. institutions and governments), by sharing

beliefs, collective aspirations, and actions (Bandura, 2000). Therefore, to restrain digital overdependence and mitigate digital harm, institutional and governance mechanisms should be mandated. For example, in 2021 the Australian government appointed an eSafety Commissioner under the Enhancing Online Safety Act 2015, to promote online safety for all Australians.[4] Similarly, the United Kingdom (UK) released the *Online Harms White Paper* in 2020, proposing measures for online safety, which suggests broader support for digital security.[5] In particular, unscrupulous online activities are thoroughly scrutinized by government agencies.

Finally, referring to the extent to which digital harm can be mitigated, we found evidence that five constructs of digital harm can be mitigated by pursuing combined attributes of SDT and Agentic theory. In practice, organizations and institutions that are largely responsible for developing and supporting technology-led digital platforms must ensure that human privilege and ethical status take precedence over digital means. In essence, the human efficacy central to our socio-normative practices should be prioritized. In 2020, Facebook was sued for harvesting the private data of approximately 87 million people without their prior consent; this was used for advertising during election campaigns (BBC, 2020). In the last few years, there have been increasing calls for big tech firms to be responsible so that they can be legally, financially, and morally held accountable for any harm their products and services cause.

5.4 Implications for policy

Led by our results, we propose three policy measures relevant to the context of digital consumption and digital harm. Our autonomy that promotes self-reflection, competence that leads to self-reactiveness, relatedness that improves intentionality, and reasoning that offers forethought are all compromised, being guided by governments, institutions, and agencies through technological and digital means. Simultaneously, our trust in governments and institutions is successively declining as our logical self,

[4] https://www.esafety.gov.au/about-us/who-we-are/about-the-commissioner. Accessed on 16/10/2021.
[5] Online Harms White Paper: Full government response to the consultation. https://www.gov.uk/government/consultations/online-harms-white-paper/outcome/online-harms-white-paper-full-government-response. Accessed on 16/10/2021.

ethical identity and reasoning are led by digital means that are being created and offered to us as part of our socio-normative process. As much as our trust is declining, so are our propensity and urge for digital consumption growing, and this is affecting our behavioural patterns (e.g. lack of self-determination resulting in anxiety, stress, and inactivity). Equally, our ethical and moral expectations that depend on the socio-economic-psychological process are suffering from fragmented and differentiated human interaction. Continuous exposure to external conditions, such as digital consumption, makes us believe in ethically dubious practices, and we accept such conditions as norms. Government, institutions, and agencies play a substantial role in this process. This arises particularly as the social agents offer us apparent convenience and user value through the new normality, feeding us with a routinized process of information that favours them. However, as individuals, we unwittingly participate and our independent critical-reflective reasoning declines. Further, under virtual reality, we can feel like contesting grounded reality and believing in alternative facts and realities, which leaves us bereft of our human enlightenment. Therefore, we propose three policy measures for government, institutions and agencies, respectively.

First, governments should formalize digital consumption and offer collective assurance that technology is assisting us, not controlling us (i.e. where we predominantly depend on the process of guidance). Thus, governments need to create policies (e.g. transparency; safeguarding from digital advancement that happens at the expense of human enlightenment) that promote our tacit knowledge and offer scope for developing human capabilities with minimal digital consumption. Second, through inter-organizational interaction, institutions should formulate policies (e.g. surveillance; ethical aspects of privacy rights) that protect, promote, and provide efficacy, reasoning and emancipation from routinized workflow with less intervention by technology and digital consumption. However, we are not proposing that governments and institutions should abandon the use of technology; rather we have illustrated how digital harms can be mitigated, should there be policies that can offer us opportunities for understanding our inner self, enhancing our self-realized choices, engaging with goal-specific activities, and improving our ethical identity. Third, we refer to agencies as socio-economic-political agents that offer us provisions fundamental to our human functions and propose that those agencies

should renew their existing policies to bring in human determination to the core of the societal process, which is central to establishing ethical businesses and practices.

5.5 Limitations and future research direction

Despite offering several novel insights, we acknowledge that this study has certain limitations. We have undertaken a comprehensive approach to formalizing the constructs of digital consumption and identified them collectively as digital harm. By conducting and analysing interviews, we have shown that digital harm arising from digital consumption can be moderated using the concepts of SDT and Agentic theory. However, further perspectives on digital consumption and complementary insights on digital harm could be gained by broadening the participant sample. In particular, the scope of the sample could be extended to include other users, such as policymakers, people involved with the judiciary and legislative process, and professionals working in other sectors. In addition, the methodology used for this study was exploratory qualitative analysis (i.e. epistemic discourse analysis and thematic analysis). Such exploratory studies often suffer from judgemental and ownership bias (King, 2004). Therefore, we foresee that using alternative methodological approaches, such as mixed-method approaches, may further enhance the rigour of the scrutiny and extend the methodological schedule. Therefore, future research should consider using mixed-method approaches to examine the characteristics of digital harm arising from digital consumption. Finally, future studies should also consider exploring the consequences of institutional involvement and the framework of governance mechanisms; although our study initiated such inquiries, they were limited and need further development.

6. Conclusions

We identified and defined five underlying constructs of excessive digital consumption and collectively termed them as digital harm. These digital harm constructs are socio-psychological deficiency, augmented reality, unethicality and trust erosion, compulsive behaviour and differentiated distance. We explored the extent to which socio-technological changes have impacted socio-normative practices and how digital consumption through digital means has affected our rationality, maturity, and autonomy.

Using two complementary theories – SDT and Agentic theory – we showed that attributes of both theories can help to mitigate digital harm, moderating the effects of digital consumption. Using epistemic discourse analysis, we identified and justified a well-expressed, implied and new development of knowledge (Bogdan, 2004; Van Dijk, 2013), which refers to the collective definition and conceptualization of digital harm. In addition, we undertook a thematic analysis using 25 interviews with different participants who had extensive experience of digital use. Referring to both SDT and Agentic theory, we showed the extent to which our autonomy promotes self-reflection, competence leads to self-reactiveness, relatedness improves intentionality and reasoning offers forethought. We supplemented our results by finding that the digital consumption that leads to deferring of logical reasoning, lack of self-realized choices, and lack of autonomy and self-control can be mitigated through deliberate and thoughtful reaction, enhanced relatedness and foresight, accentuated self-reasoning, self-autonomy, and improved intentionality. In addition, our results provided evidence that the five constructs of digital harm can be mitigated by pursuing attributes of SDT and Agentic theory: for example, autonomy can promote self-reflection, competence can lead us to self-reactiveness, relatedness can improve our intentionality, and reasoning can offer a us forethought.

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Appendix A: Related Literature corresponding to five constructs of digital harm

Panel 1: Socio-Psychological Deficiency

Authors	Research enquiry	Methods	Key findings	Limitations
Liu et al. (2019)	Phone calls and texting strengthen well-being, whereas social networking sites, instant messaging, and online gaming could displace certain social contacts and thus decrease well-being.	A meta-analysis of 124 studies	Social network content consumption (i.e., browsing other people posts without interaction) and gaming replaced meaningful interactions with significant others, and had a negative relationship with well-being due to the skewed posted contents, which led to negative social comparison.	1. The study was restricted by the nature of the available evidence regarding longitudinal patterns. 2. The classifications of media categories in the reviewed literature were quite rough. 3. The generalizability of the effects may be small.
Choi and Lim (2016)	The impacts of social load and technology load on psychological well-being mediated by social network (SNS) service addiction.	A quantitative study consisting of 419 participants in their 20s and 30s, who were SNS users in South Korea	Social and technological overload both contribute to SNS addiction, which has a negative impact on psychological well-being.	1. It failed to reflect the specific circumstances. 2. The results did not reflect the differences between relationship networks. 3. The results did not reflect individual variables, such as individual propensity 4. The sample could be too small compared with the 1.55 monthly billion active Facebook users.
Panova and Lleras (2016)	The link between Internet and mobile phone use and mental health.	Questionnaire study with 375 participants and follow-up observation	Long-term use of information and communication technology (ICT) as an emotional coping strategy may be detrimental to mental health and/or mental health inclinations.	1. The study did not include much background information about participants' ICT use. 2. The pre-group sample for study 2 was too small to give a generalizable result. 3. The study was viewed as primarily an exploratory study. 4. The study did not monitor what participants were doing on their mobile phones.
Hayes et al. (2015)	How different generations use Facebook, and whether its use is linked to increased or decreased well-being.	A series of univariate ANOVAs and regressions conducted among 529 individuals	Younger people use Facebook more often than older people, and they are considerably more emotionally affected by it. Younger people, for example, spend much more time per day on Facebook and have a more negative body image compared with older adults.	1. The study did not look at how different subgroups of older adults use Facebook and the impact it has on them, especially less educated and non-white older adults.
Choi and Toma (2014)	(1) Trends in media use for social sharing and (2) The emotional impact of mediated social sharing.	An online survey of 311 participants, using hierarchical linear modelling	The study investigated how users match media affordances with their psychological needs in social sharing.	1. The study used a sample of students, including a disproportionately high number of women. 2. Participants used multiple media to share regarding half the activities they witnessed, as

			Facebook posts have both positive and negative effects on users' subjective well-being. When negative events were shared face-to-face rather than through media, the association between sharing negative events and sharers' negative affect was weaker.	opposed to individuals who only used one platform at a time. 3. The study used a diary study procedure to evaluate correlations rather than causation between the variables of interest.
Turel and Serenko (2012)	Through the positive reinforcement it generates, information systems enjoyment can be a main factor in the creation of negative outcomes, such as technology-related addictions.	A data set of 194 social networking website users, with structural equation modelling techniques	Information system enjoyment can result in positive outcomes, such as high engagement. However, it can also lead to the formation of a strong habit and reinforce it to become a 'bad habit' which forms a strong pathological and maladaptive psychological dependency on the use of technology.	1. The study defined the state of technology addiction empirically without referring to different terminology describing this psychological state. 2. The study only used a cross-sectional convenience sample limited to one context. 3. The study did not explore the addictiveness of various features and other additional items to better capture the positive aspects of high engagement. 4. The study did not identify any potential outcomes of the antecedents of technology addiction and high engagement.
Jackson et al. (2010)	(1) Is technology use linked to dimensions of self-concept and/or self-esteem? (2) Are there variations in self-concept, self-esteem, and technology use by gender and/or race?	500 young people participated the survey	Technology use forecasted self-concept and self-esteem dimensions, with videogame play having a negative impact on self-concept dimensions and Internet use having a positive effect.	1. The reliability of the dimensions and why race differences occur have not been explored.
Valkenburg and Peter (2009)	The state of the literature on the consequences of online communication technologies for adolescents' social connectedness and well-being.	Literature review	1. Online communication stimulates online self-disclosure. 2. Online self-disclosure enhances relationship quality. 3. High-quality relationships promote well-being. 4. The stimulation effect relies on the type of technology, the user's gender and level of social anxiety.	1. Additional variables have not been considered. 2. The simultaneous effect of distinct communication technologies have not been included. 3. The same liberating or disinhibiting mechanism of online communication can have negative outcomes for adolescents.

Beas and Salanova (2009)	Factorial self-efficacy structure and relationships of different levels of self-efficacy, as well as of psychological well-being and training, among Information and Computer Technology staff.	Confirmatory factorial analysis with 496 workers	1. Low self-efficacy is linked to high levels of burnout, anxiety, and depression in the workplace. 2. High levels of self-efficacy can help workers to deal with stress effectively and training is positive for self-efficacy building. 3. Positive computer attitude moderates the relationship between computer training and self-efficacy.	1. The use of a cross-sectional design methodology needs to be interpreted with caution. 2. There are common variances for self-reported measures. 3. The sample is constituted of Information and Computer Technology workers.
Konana and Balasubramanian (2005)	Factors associated with the sociological, economic and psychological aspects or the utilitarian gains, hedonic gains and reposed trust may impact online investing.	Data collected from three sources: (1) face-to-face interviews with 35 online investors; (2) telephone and email discussions with managers at 40 brokers; and (3) detailed survey to online investors from a famous online broker.	1. Satisfaction is driven by three dimensions: perceived utilitarian gains, perceived hedonic gains, and trust. 2. Regarding the above three dimensions, several variables should be considered: Perceived operational competence, Convenience, Social and institutional safeguards, Mental accounting, Risk attitudes, Illusions of knowledge and/or control, Self-attribution, Overconfidence, Perceptions of fairness, Embarrassment avoidance, Normative social pressures, and Pursuit of social class membership.	1. The authors built the model based on the interviews and surveys but did not empirically test the model. 2. A set of 24 hypotheses would not be equally important in a specific market context.

Panel 2: Augmented Reality

Authors	Research enquiry	Methods	Key findings	Limitation
Berkemeier et al. (2019)	Solutions for barriers in diffusion and concerns about the impact of augmented reality glasses on users, organizations and society.	(1) Systematic literature review; (2) shadowing to document and analyse business processes and the workplace; (3) expert interviews; (4) focus group; (5) surveys, (6) prototyping; and (7) analogical transfer	Acceptance and privacy have been identified as critical factors for efficient instantiations, and thus play a central role in the proposed design process.	The information provided does not pertain to long-term implementations.
van Esch et al. (2019)	The effect of anthropomorphism on consumer perceptions of	319 randomly selected adults engaged in a live retail shopping experience using augmented reality on a mobile device via	1. The incorporation of humanlike characteristics and features into non-human technologies is thought to boost consumer trust in them.	1. Only Australian data was used; this may not be generalizable to other contexts. 2. The study did not compare the concept of

	augmented reality in a retail context.	structural equation modelling (specifically AMOS)	2. Consumers are confident in using augmented reality (AR) technology and can appreciate the transaction convenience it offers. 3. The capacity of AR technology to mimic human traits and intentions leads to consumer appreciation of its innovativeness. 4. The AR shopping experience can improve the immersion and presence of consumers. 5. Consumers can have difficulty distinguishing between shopping in the augmented world and in reality, but this can be overcome by anthropomorphization.	anthropomorphism across demographic profiles. 3. Only included one type of AR tool.
Roesner et al. (2014)	AR systems raise security concerns that should be addressed before they become widely used.	Review article	1. Conflicts between applications sharing input and output sensors, as well as more complex access control for sensor data, are all security and privacy concerns with AR technologies. 2. The camera on an AR device is always on, whereas the camera on a smartphone, even if turned on by malware, offers much less data when the phone is in the user's pocket.	1. Not all AR defensive strategies will rely on technical solutions. Some problems can necessitate social, policy, or legal solutions. 2. Most AR applications rely on Microsoft Kinect or smartphone platforms such as Layar and involve only one application, obscuring challenges as AR systems become more complex.
Jetter et al. (2018)	The key performance indicators (KPIs) in measuring the impact of ready-for-market AR tools on automotive maintenance performance.	Empirical validation and questionnaire survey with 51 participants in Italy and the UK, April to June 2016. Experiment run in the UK with 42 participants.	1. The study provides theoretical insights into factors motivating users to adopt an industrial AR system in the workplace (in the manufacturing field). 2. The TAM model was expanded by incorporating three KPIs identified as relevant external variables influencing 'Perceived usefulness'. 3. The most important performance indicator was 'Reduction of time and errors'.	1. As only one major area of maintenance was included, the results' generalizability is limited. 2. All findings reflect users' subjective perceptions and rely on self-reported item scales. 3. A continuous evaluation could be used to increase the number of participants. 4. Users had limited time to become familiar with the system. 5. AR is not a technical gimmick, according to various industries and potential users.

Panel 3: Unethicality and Trust Erosion

Authors	Research enquiry	Methods	Key findings	Limitations
Martin (2020)	Empirical examination of privacy post-disclosure assumed in the privacy paradox.	Factorial vignette survey methodology	1. In contrast to the privacy paradox, the findings suggest that even after disclosing information, consumers retain strong privacy expectations. 2. In creating distrust in firms and consumer (un)willingness to engage with firms, privacy violations are valued similarly to security violations. 3. Firms have a positive obligation to identify consumers' reasonable privacy expectations.	1. How the theory was operationalized in the vignettes. 2. A limitation of this study is the reliance on MTurk for the sample.
Lowry et al. (2015)	Organizational efforts to protect their information against safety threats by employees are not always full and can in fact encourage behaviours.	A pretest and a pilot test performed on the survey instrument with 553 working professionals; PLS regression via SmartPLS version 2.0 used for model analysis	1. Organizational trust can help to reduce reactive computer abuse. 2. Trust mediates both the relationship between explanation adequacy and computer abuse as well as the relationship between perceived freedom restrictions associated with enhanced information security policies and reactive computer abuse. 3. Organizational security education, training, and awareness initiatives reduced perceptions of external control and freedom restrictions while increasing explanation adequacy, and advance notification of changes increased explanation adequacy. 4. The sanction severity, certainty, and celerity constructs from deterrence theory had no significant influence on reactive computer abuse.	1. Other theories and counter-explanations have yet to be tested. 2. There has been little cross-cultural organizational security research. 3. Survey data cannot be used to control for time or to establish causation.
Myyry et al. (2009)	Non-compliance with information security policies by employees is a significant issue for businesses.	Questionnaire distributed to 163 people; regression analysis applied	1. People who exhibit pre-conventional moral reasoning are more likely to obey the policies. 2. Conventional moral reasoning (both hypothetical and actual) correlates negatively with behaviour. 3. The value dimension of 'Openness to change' is negatively associated with behaviour. 4. Hypothetical and actual behavioural choices are highly significantly related to one another	1. There is a need to investigate other aspects of ethical decision-making that influence an employee's adherence to information security policies. 2. There is a need to investigate whether individuals' moral judgement in terms of following or violating information security policies is context-bound. 3. Participants did not consider non-compliance with security policies to be a moral issue.
Friedman et al. (2000)	10 online interaction characteristics that	Conceptual discussion	1. When people are online, it is more difficult (sometimes meaningless) to analyse the potential harm	Not mentioned.

	can aid in the engineering of trust online and distinguish between trust in e-commerce activities and trust in online interpersonal communication		and goodwill of others, as well as what constitutes reasonable performance of the machine. 2. People can have roughly similar online interactions and come to widely disparate conclusions as to whether the communications are trustworthy.	

Panel 4: Compulsive Behaviour

Authors	Research enquiry	Methods	Key findings	Limitations
Clements and Boyle (2018)	Major technological behavioural initiation and psychological behavioural persistence mechanisms that contribute to compulsive technology use.	Survey research with 623 students; structural model assessed in SmartPLS	Technology instability, technology complexity, and technology-enabled triggers are identified as important characteristics of technology that contribute to the phenomenon of compulsive technology use.	1. Cross-sectional research designs collect data at one time, therefore a longitudinal approach which measures the amount of time required by compulsive technology would be preferable. 2. A convenience sample of college students was used. 3. Restricted target mobile applications were used for the study.
Aladwani and Almarzouq (2016)	The model suggests that social media use is caused by factors of self-awareness and, together, predict problem-based learning outcomes. It also hypothesizes that the impact of technological factors moderates these relationships.	Path analysis and subgroup analysis using SPSS; 407 students correctly filled in the questionnaire	1. Self-esteem has a large negative impact on compulsive social media use, whereas interaction anxiety has a significant positive influence on the same. 2. Only compulsive social media use has a large direct influence on problematic learning outcomes, with social media complementarity acting as a moderator.	1. The influence of other self-awareness constructs (e.g. loneliness and self-concept clarity) on compulsive social media use needs to be considered. 2. There is a need to involve other moderators, such as media type. 3. Data precision needs to be examined as this may affect the reliability of the findings.
Lee et al. (2014)	The relationship between psychological traits and smartphone users' compulsive behaviours, as well as the stress caused by these compulsive behaviours	325 participants; structural equation modelling with competing models	Psychological features, including locus of control, social interaction anxiety, materialism and the need for touch, are linked to the compulsive use of smartphones and technostress. The above-mentioned relationships also show gender differences.	1. The problems attributed to the variance of the common method could be overestimated. 2. There is not enough evidence of causal relationships available from the current research alone.

Turel et al. (2011)	Technology addiction and user perception in the context of online auctions.	Two empirical studies of 132 and 223 eBay users	Online auction addiction levels influence reasonable IT use decisions by altering users' beliefs. The development of poor perceptions is driven by a combination of the processes of memory, learning and bias cognition.	1. The definition of compulsive buying has only been addressed recently. 2. Other variables may mediate the links between technology addiction and perception. 3. The data in the study was skewed and the sample relied on cross-sectional convenience. 4. The study did not clarify the causes of addiction.

Panel 5: Differentiated Distance

Authors	Research enquiry	Methods	Key findings	Limitations
Kaplan and Tripsas (2008)	Understanding technology trajectories through the life cycle using a cognitive lens.	Conceptual analysis	1. The study identified the conditions from which cognitive scope may alter the anticipated technological output expected by strictly economic or organizational models. 2. The construction of collective frames around the nature of new technology is shaped by the interactions of producers, consumers, and institutions.	The study did not cover the following areas: 1. How technological frames are created (by antecedent conditions such as experience and routines) and how they develop over time. 2. Which types of interactions are most effective at various stages of the technology life cycle, to what degree actors can form the frames of others, and under what conditions purposeful action is possible. 3. Gaining a better understanding of how manufacturers, consumers, and institutional actors think about technology will help with theoretical, managerial, and policy issues.
Leonardi and Barley (2008)	The essence of technologically induced organizational change.	Theory building	1. It is important to acknowledge the significance of the material and the social when building theory about the relationship between information technology and organizations. 2. The study identifies four obstacles that researchers must overcome before they can reconcile the fact of materiality with the idea that technological transition outcomes are socially constructed.	Not mentioned.
Kappos and Rivard (2008)	How culture influences and is influenced by the development and use process of an information system (IS).	Literature review	1. The paper adopted a conceptualization which regards culture from three dimensions: integration, differentiation and fragmentation. 2. The study found that culture influences the development process and moderates the relationship	1. Future research should focus on the impact of ambiguous interpretations of an IS. 2. Future research should focus on performing a study from various perspectives.

			between the development process and the features of the IS. 3. Culture moderates the relationship between IS features and acceptance and resistance, and it also moderates the relationship between the IS process and use process. 4. IS uses influences culture.	
Kenrick et al. (2003)	Individual decision mechanisms are thought to interact with decision mechanisms in social networks in a dynamic way.	Conceptual analysis	1. Different decision processes produce different complex outcomes and socio-spatial geometries in different domains. 2. Individual decision processes and group dynamics are intertwined, providing insights into gene–culture interactions.	1. The simulations used in the study are intrinsically limited in ecological validity. 2. Only a small subset of the implications was considered; for example, processes linked to status, mate retention, intergroup protection, or parenting were not modelled.
DiMaggio et al. (2001)	The Internet seeks to supplement rather than replace current media and behavioural trends.	Theoretical evaluation	1. The analysis examined the institutional structure, industry and political economy of the Internet. 2. Sociology has been reluctant to capitalize on the rare opportunity to research the advent of a potentially transformative technology in situ.	Not mentioned.