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Young adults' online shopping addiction: The role of self-regulation and smartphone use

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Abstract

Online shopping addiction can be defined as an Internet-based behavioural addiction which may lead to economic problems. Even though shopping is increasingly common through mobile devices, the effects of smartphone use on online shopping addiction are underexamined. Following a survey of 1000 18 to 29-year-olds in Finland, we examined young adults' online shopping addiction and economic problems from the perspective of self-regulation and problems in regulating smartphone use. The results indicated that low self-regulation in an online environment facilitates online shopping addiction, which further leads to dissatisfaction toward personal money management through indebtedness. Moreover, we illustrated how distractive stimuli of digital environments can act as primers for addiction by showing how problems in regulating smartphone use facilitates online shopping addiction for young adults with generally low self-regulation. We conclude our article by offering guidance on how the teaching of self-regulatory strategies as well as financial and information communications technology skills may decrease the tendency for online shopping addiction.

KEYWORDS

compulsive buying, financial wellbeing, indebtedness, online shopping addiction, self-regulation, smartphone

1 | INTRODUCTION

The current study focuses on compulsive buying behaviour and shopping taking place in an online context, namely online shopping addiction. We approach online shopping addiction as a behavioural addiction where an individual forms an excessively strong attachment to shopping on the Internet (Jiang et al., 2017) despite consequent potential financial, social, and emotional problems (Grant et al., 2010). Thus, a key element in online shopping addiction is a failure to regulate and control one's online shopping behaviour despite the harms associated with it (American Psychiatric Association, 2013). Low self-regulation is the inability to manage a limited set of cognitive, emotional, and behavioural

resources that the individual utilizes to alter and control their behaviour (Baumeister, 2002; Hedgcock et al., 2012; Vohs & Faber, 2003). Prior studies also associate behavioural control with responses to mobile marketing and advertising (Jebarajakirthi et al., 2021). In the present study, we examine self-regulation as the readiness to carry out self-regulatory processes, rather than as a trait-like entity. We approach self-regulation from the perspective of learned strategic control of thoughts, actions, and motivations to achieve personal goals (Inzlicht et al., 2021; Zimmerman, 2008). Therefore, we examine online shopping addiction in relation to problems in regulating smartphone use, which involves the excessive use of one's smartphone accompanied by difficulties in regulating and controlling its use (Billieux et al., 2015).

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The COVID-19 pandemic increased the importance of digital environments in consumption, as online shopping replaced shopping in physical stores during temporary restrictions of freedom of movement and close contact (Gordon-Wilson, 2022; Zamboni et al., 2021). According to Statista (2021) in 2021, global retail online commerce sales amounted to approximately 5.2 trillion U.S. dollars and the figure is expected to grow by 56% over the next years, reaching about 8.1 trillion dollars by 2026. There is also evidence of an increase in addictive online behaviours during the COVID-19 pandemic, such as smartphone addiction (Choi, 2021) and compulsive online shopping, particularly among young people (Gordon-Wilson, 2022; Zamboni et al., 2021). This pandemic purchase experience has potential to define what is regarded as the new normal in the post-pandemic world (Rippé et al., 2022), which highlight the importance of understanding the problematic online behaviours of the young.

Moreover, current economic instability emphasizes the importance of studying young adults' personal financial instability as a 'life condition' of this life stage (Lanz & Serido, 2020). The behavioural component of subjective financial wellbeing, as a multidimensional construct, is defined as one's perception of the ability to manage material resources, that is, money management (Sorgente & Lanz, 2019). Addictive behaviours that require monetary involvement, such as compulsive buying, are prone to cause economic harm and long-term financial difficulties such as debt problems (Wang & Xiao, 2009). Prior research has acknowledged that compulsive buying behaviours and subsequent indebtedness are problems especially among the young (Mowen & Spears, 2008). Therefore, we examine them in the form of young adults' money management as the behavioural component of subjective financial wellbeing (Sorgente & Lanz, 2019) and young adults' indebtedness (Sorgente & Lanz, 2017). In sum, in the present study, we investigate relations between low self-regulation, online shopping addiction, and problems in regulating smartphone use among young people aged 18–29 as well as consequent problems in money management and indebtedness. Despite its topicality and the importance of understanding compulsive online shopping behaviours, there is a lack of empirical research on the relationship between online shopping addiction and self-regulation (Jiang et al., 2017; Rose & Dhandayudham, 2014). To fill this research gap, we explored how lack of smartphone use regulation moderates the association between low self-regulation and online shopping addiction.

First, we address a call for more research on how online shopping addiction is associated with other constructs (Barrera & Ponce, 2021), such as cognitive overload (Rose & Dhandayudham, 2014) and a need for research on the phenomena with a more heterogeneous sample than college students (Jiang et al., 2017; Zhao et al., 2017). Therefore, we examine the construct of online shopping addiction in relation to cognitive overload of smartphone use among an extensive heterogeneous young adult sample. Second, we study if online shopping addiction is directly linked to negative perception of financial wellbeing or only through financial difficulties manifested as indebtedness. This is examined because shoppers with compulsive tendencies are known to be less concerned for their financial situation (Lo & Harvey, 2012). Third, we contribute to the literature on the priming effects of digital

environments (Doyen et al., 2012). Since shopping is increasingly experienced through mobile devices, even while in-store shopping and completing other offline activities (Lawry & Bhappu, 2021), there should be more focus on how the stimuli via smartphones affects compulsive buying. Although there is wide evidence on how online stimuli affects consumer decision making (Laran, 2020; Rose & Dhandayudham, 2014), the present study is among the first studies to investigate the effect of problems in regulation of smartphone use on consumers' problematic online and shopping behaviours.

2 | THEORETICAL FRAMEWORK

2.1 | Addictive behaviour and low self-regulation

Pathological forms of shopping and buying behaviours are not new phenomena. For instance, compulsive buying disorder and buying-shopping disorder have been acknowledged for over 100 years, characterized by a high preoccupation with shopping and buying behaviours and an irresistible urge to act on this, leading to distress and impairment in wellbeing (Müller, Brand, et al., 2019). Ever since, problematic and excessive shopping behaviours have been conceptualized with terms such as 'compulsive buying' (Ridgway et al., 2008), or 'buying disorder' (Müller et al., 2017). Essentially, these conceptualizations are describing similar phenomena, even though terminology and focus might differ between approaches and studies. Here, we approach problematic forms of buying (e.g., compulsive buying) from the perspective of addictive behaviours that are inherently characterized by compulsive and impulsive tendencies (Rose & Dhandayudham, 2014; Zhao et al., 2017).

Online shopping addiction and other forms of pathological shopping behaviours share many key characteristics with other behavioural addictions (Grant et al., 2010; Rose & Dhandayudham, 2014; Zhao et al., 2017). Behavioural addictions can be defined by a repetitive urge toward a particular activity or behaviour, and the inability to regulate and control that behaviour regardless of negative consequences (Derevensky et al., 2019; Grant et al., 2010). Behavioural addictions are nowadays widely recognized, including excessive forms of gambling, gaming, Internet use, and having sex (Derevensky et al., 2019; Griffiths, 2005). Behavioural addictions are distinguished from substance-related addictions such as drug or alcohol abuse, even though these behaviours tend to overlap (Yau & Potenza, 2015).

In the literature, online forms of excessive shopping behaviours have been referred to with concepts such as 'problematic Internet shopping' (Ko et al., 2020), 'pathological buying online' (Trotzke et al., 2015), and 'online shopping addiction' (Rose & Dhandayudham, 2014; Zhao et al., 2017). Here, we use the term 'online shopping addiction' to cover addictive and compulsive forms of online shopping. We follow the definition by Zhao et al. (2017, p. 2), who describe online shopping addiction as '...a tendency of excessive, compulsive and problematic shopping behavior via the Internet that results in consequences associated with economic, social, and emotional problems'. This approach to online shopping addiction is in line with general definitions of behavioural addictions, where an individual forms a strong attachment with a particular activity and fails to

resist the urge regardless of negative consequences such as individual and social costs (Grant et al., 2010). The definition of online shopping addiction by Zhao et al. (2017) also covers the six central characteristics that are common to addictions as proposed by Griffiths (2005): salience, mood modification, tolerance, withdrawal, conflict, and relapse that are also considered in this study when measuring the online shopping addiction.

In addition to similarities with behavioural addictions, some scholars have approached online shopping addiction as having similarities with impulse control disorders and obsessive-compulsive disorders (see Müller et al., 2017). However, online shopping addiction is not officially listed as a disorder in the Diagnostic and Statistical Manual of Mental Disorders (DSM) or the International Classification of Diseases (ICD). 'Compulsive shopping', however, is included in the ICD-10 and is classified as an impulse control disorder (McElroy et al., 1995). Addictive or compulsive behaviours, such as those related to consumption, are often accompanied with problems in self-regulation, which manifest in impulse behaviours and a failure to resist temptations (Baumeister, 2002). Some researchers criticize the over-pathologizing of everyday usage of the Internet and discuss the possibility of dysfunctional self-regulation as a risk factor for problematic or addictive forms of the Internet (Reinecke et al., 2021).

General self-regulatory processes are due to an individual's effort to focus on reaching their original goals regardless of distractions (Inzlicht et al., 2021). Self-regulation also includes managing and utilizing tools, such as digital technologies, in meaningful, deliberate ways (Sjöblom et al., 2020). Among students, self-regulated learning is related to reflection and deep-level learning, whereas lack of self-regulation is related to surface processing (Heikkilä & Lonka, 2006), which may lead to deficits in decision-making and rational reasoning. Wisniewski et al. (2017) framed self-regulation as a resiliency factor that protects, for example, teens from deviant peer influences and antisocial behaviour. Prior consumer behaviour literature links low self-regulation to addictive behaviour (Baumeister, 2002; Rose & Dhandayudham, 2014). The habits of young people are often socially shared, especially when it comes to the use of technology; interpersonal factors, such as role models, personal interests, and social networks have their bearing on seemingly compulsive behaviours (Hietajärvi et al., 2019; Kruskopf et al., 2021).

In the financial domain, financial socialization by external socializing agents, such as parents, largely influences financial behaviour among young adults, but gradually the role of self-beliefs in financial behaviour and financial wellbeing becomes more important (Ranta, Chow, et al., 2020). From the perspective of social cognition, self-regulation includes context-specific processes used to achieve personal and social goals. These processes are cyclical, and they include affective and behavioural processes, and a resilient sense of self-efficacy to control these processes (Zimmerman, 2000). Regardless of the origin of self-regulation, we are focusing on the individual tendency in the present study.

Personal tendencies affect how people process information and, consequently, how they act when facing the option of whether to exert self-control or to indulge (Laran, 2020). There is also variation in

terms of how much young people have learned to regulate their own thinking, motivation, and strategies (Järvelä & Hadwin, 2013). People who have low self-control also perceive regulating their behaviour as laborious (Laran & Janiszewski, 2011) and, consequently, they are more likely to distort memories of their past self-control to licence themselves to indulge (May & Irmak, 2014). LaRose and Eastin (2002) found a direct positive association between low self-regulation and excessive online shopping. Similarly, Rose and Dhandayudham (2014) have proposed this same effect in their conceptualization. Thus, we suggest:

H1. *Low Self-Regulation will positively relate to Online Shopping Addiction.*

2.2 | Online shopping addiction and problems in regulating smartphone use

Online shopping addiction has notable similarities with Internet addiction, and it is justifiable to approach online shopping addiction as an Internet-based addiction (Dell'Osso et al., 2021; Zhao et al., 2017). Indeed, scholars have commonly approached online shopping addiction as a specific type of Internet addiction (Dell'Osso et al., 2021; Trotzke et al., 2015; Zhao et al., 2017) and have distinguished it from a general Internet addiction. In other words, in online shopping addiction, the Internet connection only allows for maintaining a specific activity (in this case online shopping), but the individual is not addicted to the Internet as such. Offline and online forms of excessive shopping can also overlap. A study by Müller, Steins-Loeber, et al. (2019) found that problematic online shopping was prevalent in a clinical sample of patients with buying-shopping disorder. As stated above, it is also possible that behind such compulsive behaviour, there may lie self-regulatory problems that are not only general, but also, related to the use of smartphones as the main medium for using the Internet.

Online shopping addiction is approached as a specific phenomenon different from offline shopping because of the unique characteristics of the online environment. First, constant availability of online shopping opportunities and the relative easiness of purchasing make it easy to make hasty and impulsive purchase decisions without deliberate thinking. Second, online platforms' algorithms intertwine with users' preferences and earlier browsing history, which manifest in personalized advertising and recommendations. Third, using the Internet and browsing social media may lead to purchasing even though the original intention of online use was something else. For example, exposure to targeted ads in regular social media use can make it tempting to browse online shopping sites. Constant availability and exposure to temptations is a risk for maintaining and developing addictive behaviour (Welte et al., 2007). Problems in regulating smartphone use add to this equation, because of external affordances and algorithms that are provided via smartphones. Young people who lack self-regulation and in addition, have problems in handling the external stimuli provided by the devices and algorithms, may have serious

problems in controlling their Internet use and online behaviour (Reinecke et al., 2021). It is not the device itself that is the problem, but the problems in both self-regulation and the general challenges of Internet use are multiplied with the constant flow of information and distractions in our pockets.

In the context of smartphone use, self-regulation can be approached as an internal state, trait, or tendency (Hong et al., 2020), a more state-like construct, or as a learned skill that appears quite stable (Inzlicht et al., 2021). Problems in regulating smartphone use involve not only the general cognitive processes and strategies of self-regulation, but also, the smartphone-related challenges that the user needs to overcome: first, the external affordances that the notifications and other functions of the device and second, coping with the algorithms that are designed to lessen the regulation of the smartphone use and feed contents to the users that may be regarded as distracting them from the original goals and tasks that they are supposed to complete.

As a general tendency, self-regulation may protect from smartphone addiction (Gökçearsan et al., 2016). High level of self-regulation may function as an extensive psychological resource that buffers the effect of problematic smartphone regulation on daily cognitive failures (based on Hong et al., 2020). Besides low self-regulation as a personal tendency or ability, previous research links online shopping addiction to lack of ability to resist arousal and the effect of the external environment (Rose & Dhandayudham, 2014). Rose and Dhandayudham (2014) argue that frequent and constantly changing stimuli of the digital environment provide repeated stimulation and temptation, potentially creating cognitive overload for the individual, and thus directly affecting addictive buying behaviour. Habitual media multitaskers have an information-process bias in favour of attending and processing greater amounts of information, even information that is not directly relevant (Lin, 2009). Moisala et al. (2016) showed that media multitasking was associated with distractibility in information processing, that is, difficulty to maintain attention toward a task, and such a tendency emerged on the neural level as increased prefrontal activity in adolescents and young adults. Duff et al. (2014) also revealed a positive relationship between media multitasking and advertising utility. Therefore, we postulate:

H2. *Problems in Regulating Smartphone Use* will positively relate to *Online Shopping Addiction*.

2.3 | Young adults' money management and indebtedness

Financial behaviour is one of the three components of financial skills, or financial capability, particularly, in addition to financial knowledge and financial self-belief which relate to individuals' financial wellbeing (Sorgente & Lanz, 2017). Namely, individuals' perception of their ability to manage material resources, that is, their *money management*, is an important evaluation of their own financial condition as a component of the multidimensional construct of subjective financial wellbeing (Sorgente & Lanz, 2019). The concurrent changes in the consumer economy with digitalization and consumption demands,

however, pose new threats on especially young adults' subjective financial wellbeing (Shim et al., 2009). For example, the financial insecurity young adults often experience may lead to high rates of student and consumer debt (Dettling & Hsu, 2018), which have been increasing especially in terms of credit card debt (Jiang & Dunn, 2013).

As money management is not automated behaviour, it requires conscious thought, and therefore it is dependent on self-regulation (Baumeister et al., 2000; Kamleitner et al., 2013; Muraven & Baumeister, 2000). For this reason, depletion of resources for self-control increases the likelihood of poor consumer decisions (Hedgcock et al., 2012; Kamleitner et al., 2013) and leads to the adoption of heuristics and intuitive rather than rational decision strategies (Kamleitner et al., 2013). For most individuals, retaining financial self-control requires willpower (Kamleitner et al., 2013). For this reason, the more resources for self-control are depleted, the more likely it is that financial control slips. Thus, we suggest:

H3. *Low Self-Regulation* will negatively relate to *Money Management*.

Addictive behaviours are burdening and distressing to the wellbeing of an addicted individual and their close ones, causing emotional and social problems (Grant et al., 2010). Regarding compulsive shopping behaviour, it is shown that it is linked to unsuspected overspending. Lo and Harvey (2012) demonstrated that compulsive shoppers are less concerned about their budgets than non-compulsive shoppers, as they failed to check their account information when shopping. Hence, these consumers are more likely to become addicted because they tend to be careless when they exceed their budget (Lo & Harvey, 2012).

Kamleitner et al. (2013) do not only depict causes of over-indebtedness but also describe an influence of over-indebtedness on money management. They acknowledge the difficulty in drawing causal implications between indebtedness and money management and suggest that people facing debt problems are likely to be unsatisfied with their money management and are obligated to seek financial counselling. Also, Greenberg and Hershfield (2019) state that the ability to control spending as opposed to making impulsive spending decisions is vital for subjective financial wellbeing. Therefore, we postulate:

H4. *Online Shopping Addiction* will positively relate to *Indebtedness*.

H5. *Online Shopping Addiction* will negatively relate to *Money Management*.

H6. *Indebtedness* will negatively relate to *Money Management*.

2.4 | Interaction moderating effect

As suggested above, general self-regulation may not cover the full story. Smartphones may offer a boost for those who are lacking

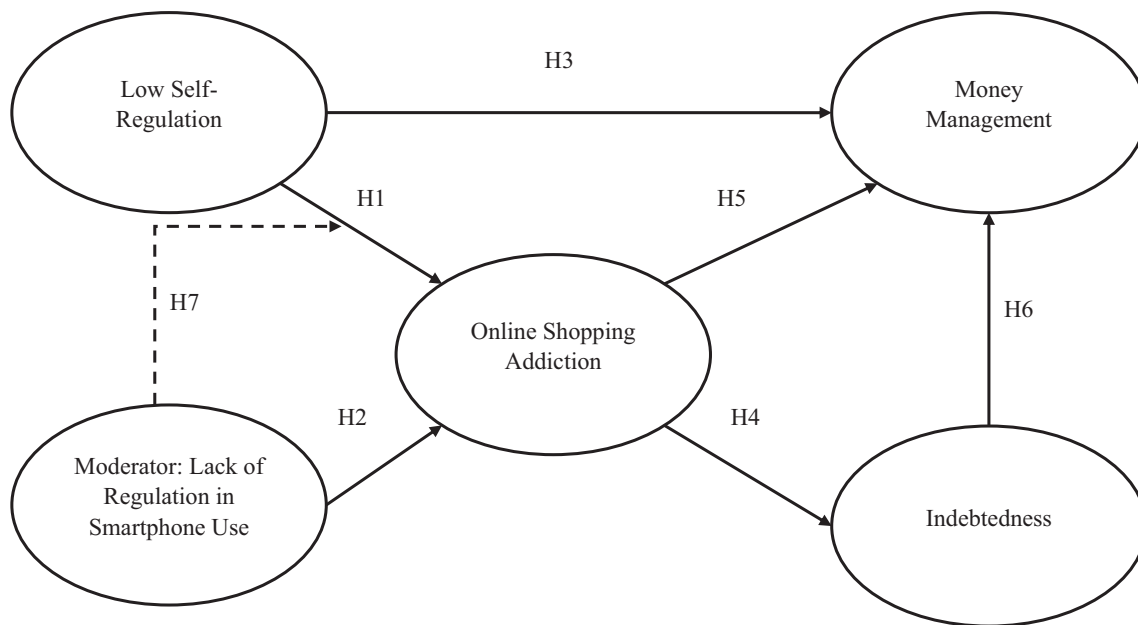


FIGURE 1 Framework and hypotheses. H1: Low self-regulation will positively relate to online shopping addiction. H2: Problems in regulating smartphone use will positively relate to online shopping addiction. H3: Low self-regulation will negatively relate to money management. H4: Online shopping addiction will positively relate to indebtedness. H5: Online shopping addiction will negatively relate to money management. H6: Indebtedness will negatively relate to money management. H7: The positive relationship between low self-regulation and online shopping addiction is moderated by problems in regulating smartphone use. The greater the problems in regulating smartphone use, the stronger the association.

self-regulatory ability or who have not developed their self-regulatory skills (it is quite difficult to measure causal reasons for the low self-regulation). Therefore, we expect that problems in regulation of smartphone use may add to the low self-regulation and online shopping addiction, because they bring in also external distractions that are often designed to lure people to deviate from their original goals. Prior studies have recognized the relationship between Internet addiction and low self-control by showing that a continuous exposure to the online stimuli decreases one's self-regulation (Rose & Dhandayudham, 2014). Such stimuli are pop-up adverts, timed discount offers, interactive product display, and 'one click' purchases, all of which deplete the individual's resource capacity for self-regulation (LaRose & Eastin, 2002). There is also evidence about the relation between problems in self-regulation and problematic smart phone use (Ching & Tak, 2017). The use of a smartphone can have similar effects due to music, messaging, social networking, and frequent notifications. Targeted advertisements based on the tracking of consumers' online behaviour and highly influential interaction on social media (Ramadan et al., 2021) are likely to further induce both planned and impulsive purchases online (Dodoo & Wu, 2019). David et al. (2015) refer to this phenomenon as mobile (i.e., smartphone) distraction. Such distractive effects can act as primers that influence the person's judgements and behaviour without their awareness (Laran et al., 2008). These primers can exert an influence by leading to the activation and inhibition of information associated with a semantic concept, a person's self-concept, or goals (Janiszewski & Wyer, 2014). Self-concept priming occurs when information in the environment makes a certain trait more accessible and influences subsequent judgements and behaviours

(Laran, 2020). Despite the debate about the strength and robustness of primer effects (Doyen et al., 2012), there are numerous demonstrations of how priming effects have for instance increased shopping for unplanned items (Laran, 2020).

Problems in regulating smartphone use can be regarded beyond a behavioural addiction because the use of these devices is interpersonal in nature and their use covers many areas of life that are interconnected (Billieux et al., 2015). Further, smartphone use provides external affordances and is based on algorithms that are designed to distract the users from the original tasks and goals (Laran, 2020; Rose & Dhandayudham, 2014). Such examples include social media use and mobile payment methods that make impulsive shopping easier and motivated based on social relations and the shared opinions of others (Aragoncillo & Orus, 2018). In the present study, we assume that the readiness to regulate one's actions may be moderated by problems in regulating smartphone use. Self-regulation is an individual tendency or skill, but the algorithms, notifications, and external priming effects provided by smartphones may magnify the problems in personal self-regulation. Earlier research has also shown that often benign unregulated media use behaviours may evolve into behaviours that are compulsive, uncontrolled, and indulgent, and interfere with life (LaRose et al., 2003). Therefore, we postulate:

H7. The positive relationship between *Low Self-Regulation* and *Online Shopping Addiction* is moderated by *Problems in Regulating Smartphone Use*. The greater *Problems in Regulating Smartphone Use*, the stronger the association.

2.5 | Summary of the theoretical framework

Based on our theoretical framework, we propose a research model (Figure 1). We propose that Low Self-Regulation is directly linked to a tendency for Online Shopping Addiction (H1+). Alongside that we hypothesize that Problems in Regulating Smartphone Use is directly linked to Online Shopping Addiction (H2+). We also postulate a direct negative association between Low Self-Regulation and one's personal Money Management (H3-). We further suggest that Online Shopping Addiction is directly linked to Indebtedness (H4+) and negatively associated with Money Management (H5-). We also suggest a direct negative association between Indebtedness and Money Management (H6-). Altogether, the model implies that the negative effects of low self-regulation on money management are partially mediated through online shopping addiction and indebtedness. We also propose that a lack of regulation of smartphone use accelerates the effect of self-regulation to addictive behaviour, that is, the association between low self-regulation and online shopping addiction is positively moderated by a problems in regulating smartphone use (H7+).

3 | METHODOLOGY

3.1 | Data collection

The data were collected using an online web panel in Finland. Finland is a post-industrial, affluent society (Wilksa, 2002) with extensive communication technology infrastructure. The use of both the Internet and e-commerce (including mobile) has been widely adopted among Finnish consumers: 92% of the Finnish population aged 16–89 years use the Internet, and 54% had purchased either products or services online within the previous 3 months in 2020 (OSF, 2020). The young adults were chosen as the research subject, because behavioural addictions, such as online shopping addiction, typically start to develop in childhood, adolescence, or young adulthood (Derevensky et al., 2019), potentially leading to long-lasting consequences. Also, the rapid digitalization of consumption environments has affected young people the most, as consumption is a crucially important element in young people's identities (Wilksa, 2017). Young people shop more online and spend more time on social media than individuals in older age groups (Dhanesh & Duthler, 2019; OSF, 2021a).

The web panel sample was gathered to represent the general young adult population (18–29-year-olds) of Finland with stratified sampling based on quotas of age groups of 18–22, 23–25, and 26–29 years and gender and region (large areas, NUTS2). Panel members were contacted in random order from December 2 to 11, 2020 by a marketing research company. In total, 1000 answers were gathered. The whole panel consists of approximately 350,000 panellists in Finland. The web panellists are volunteers who choose to respond to surveys according to their likes and interests. The panellists are also rewarded for their time and effort. The respondents' identities were kept confidential. The marketing research company assured the quality of data by excluding invalid responses.

3.2 | Measures

The scales used to measure each construct were drawn from the prior literature, and some of them were modified to better fit the context of the present study. The items measuring *Online Shopping Addiction* were adopted from the scale by Zhao et al. (2017), which covered all six central aspects of behavioural addiction (Griffiths, 2005) and therefore provided a robust indicator for addictive shopping behaviour in the online context.

The scale for *Low Self-Regulation* was modified based on Lonka et al. (2008) and Vermunt (1998), which was originally used in higher education research. In the present study, low self-regulation was assessed with three statements that indicated general regulatory problems. The second author (anonymized) and her research team developed the new scale *Problems in Regulating Smartphone Use*, based on their research on digital learning (Hietajärvi et al., 2019; Salmela-Aro et al., 2017). For the present study, we adjusted the new measures to be more general and to fit the context of the present study. For instance, the original statement 'The notifications of my smartphone disturb my studying' was transformed into: 'The notifications of my smartphone disturb my other activities'.

The scale for *Money Management* was drawn from the 25-item Multidimensional Subjective Financial Wellbeing Scale by Sorgente and Lanz (2019). Respondents answered the statements using the Likert-type scale: answers ranged from 1 (completely disagree) to 6 (completely agree). *Indebtedness* (mean = 2.08, SD = 1.32) was measured using a single item adopted from Wang and Xiao (2009) and used a 5-point semantic differential scale: 'Which of the following statements best describe your indebtedness? Choose the option which best suits your situation: 1 = The payment of bills, payments, and/or payment instalments is not troublesome, and I am able to save money in the process; 2 = The payment of bills, payments, and/or payment instalments is not troublesome, however I am unable to save money in the process; 3 = The payment of bills, payments, and/or payment instalments is continuously challenging for me; 4 = I have received payment notices and have been subject to paying tardiness interest, as I have not had sufficient funds to complete payments when the needed payments have been due; and 5 = I have a compromised credit score/have been subject to repossession actions'.

3.3 | Nonresponse bias and common method bias

Nonresponse bias was assessed by comparing the sample to the structure of the population aged 18–29 years in Finland (cf. OSF, 2021b). The data was a representative sample of the young adult population with respect to gender, age, living area (city vs. countryside/rural area), educational background, and disposable annual income (see Table 1). The common method bias (CMB) was minimized through the following procedures. Questionnaire items were mixed, and we strived to

TABLE 1 Sample characteristics.

		Sample	Population (2019)
Gender	Male	52%	51%
	Female	49%	49%
Age	18–20	27%	23%
	21–23	21%	24%
	24–26	29%	26%
	26–29	23%	27%
Living area	City	85%	83%
	Countryside/rural area	15%	17%
Highest education	Comprehensive education or incomplete	13%	15%
	Upper secondary education	59%	64%
	Polytechnic or bachelor's degree	21%	16%
	Master's degree or postgraduate degree	7%	5%
Disposable annual income	Median	12,000 €	11,726 €
	Mean	15,286 €	12,465 €

TABLE 2 Item and factor (dimension) statistics.

Indicator	Mean	SD	FL
<i>Online shopping addiction</i>			
I spend more and more time on online shopping.	1.96	1.21	.70
When I am not shopping online, I keep thinking about it.	2.06	1.22	.76
If I cut down the amount of online shopping in one period, and then start again, I always end up shopping as often as I did before.	1.87	1.21	.80
I have decided to do online shopping less frequently but have not managed to do so.	2.26	1.27	.83
I have tried to cut back or stop my online shopping but failed.	2.07	1.19	.77
Online shopping can help me to temporarily forget the troubles in real life.	1.94	1.20	.75
My productivity for work or study has decreased as a direct result of online shopping.	2.09	1.19	.80
Life without online shopping for some time would be boring and joyless for me.	2.31	1.24	.85
When I cannot do online shopping for certain excuses, I will get depressed or lost.	2.06	1.22	.83
<i>Low self-regulation</i>			
I have noticed that I have problems handling a big amount of information.	2.41	1.23	.64
The demands that are expected from me are too high for me to clear them well.	2.70	1.10	.78
It is difficult for me to judge whether I can handle things well enough.	2.97	1.12	.63
<i>Problems in regulating smartphone use</i>			
The notifications on my smartphone disturb my other activities.	3.27	1.42	.51
I have difficulties in controlling myself because I constantly need to check my smartphone.	3.25	1.40	.75
I cannot regulate my smartphone use at all.	2.67	1.39	.82
<i>Money management</i>			
I am satisfied with the way I manage my money.	3.31	1.13	.77
I am satisfied with the way I spend my money.	3.10	1.11	.71
I feel I can handle my financial situation.	3.50	1.05	.62
I am satisfied with the way I manage my financial situation.	3.23	1.06	.79

Abbreviation: FL, factor loading.

minimize item ambiguity. To disclose the possibility that the results could be interfered with by CMB, Harman's single factor test (Harman, 1976) was conducted. The results of Harman's single factor test show

that CMB is unlikely an issue in our data set because the total variance extracted by one factor is 34.926% and it is below the threshold of 50%.

3.4 | Analysis strategy

To test the conceptual model and proposed hypotheses, Structural Equation Modelling (SEM) with the maximum likelihood estimation method with bootstrapping was employed using IBM SPSS AMOS 26 software. We performed SEM with several latent constructs and one manifest variable, *Problems in Regulating Smartphone Use*, in mediating between low self-regulation and online shopping addiction. The hypothesized moderating effect was tested using PROCESS v3.5 by Andrew F. Hayes (Hayes, 2012).

The measurement scales consisted of 19 items that involved five constructs (Table 2). The measurement model was designed to measure the following four latent constructs: Online Shopping Addiction, Low Self-Regulation, Money Management, and Problems in the regulation of Smartphone Use. The model fit was examined and found to show an acceptable fit ($\chi^2(75) = 231.57$, CMIN/DF = 4.003, IFI = 0.979, CFI = .95, TLI = .97, RMSEA = .05, 90% CI [.05, .06], and SRMR = .05, RFI = 0.96). The validity of the measurement model and the unidimensionality of the constructed scales were tested with a confirmatory factor analysis (CFA). The results of the reliability and validity of the measurement scales show that all component loadings were equal to or greater than 0.5.

The items were also found to converge on their assigned factors as the average variance extracted (AVE) values exceeded or were slightly below the cut-off value of 0.50, but the composite reliabilities for all factors ranged from 0.726 to 0.816, thus demonstrating good internal reliability (Bagozzi & Yi, 2012). The measurement model was also tested for

discriminant validity using Fornell and Lacker's AVE (Fornell & Lacker, 1981) method and Bagozzi's method (Bagozzi, 1991). The correlations between the constructs were equal or below 0.60, and therefore the square roots of the AVEs showed acceptable discriminant validity (Table 3).

4 | RESULTS

4.1 | Structural equation model and interaction testing

The results of hypotheses testing are shown in Table 4. The model fit was assessed through several indices, which indicate a good fit despite the high chi-square value (Schermelleh-Engel et al., 2003). The values of IFI, TLI, RFI, and CFI were clearly above .9 and ranged from .93 to .95; the value of RMSEA was .05; and the value of CMIN/DF was clearly below the cut-off value of 5 (Hu & Bentler, 1999).¹

The conceptual model accounted for 41% of the variance in *Online Shopping Addiction*, 18% of the variance in *Money Management*, and 2% of the variance in *Indebtedness*. The results also supported nearly all proposed hypotheses. As hypothesized, both *Low Self-Regulation* ($\beta = .38$, $t = 6.61$, $p < .001$) and *Problems in Regulating Smartphone Use* ($\beta = .46$, $t = 11.55$, $p < .001$) were positively associated with *Online Shopping Addiction* supporting H1 and H2. Also, *Low Self-*

TABLE 3 Validity, reliabilities, and intercorrelations.

	Mean	SD	α	CR	AVE	1	2	3	4
Online shopping addiction (1)	2.13	1.22	.94	.94	.62	.79			
Low self-regulation (2)	2.90	1.12	.72	.73	.47	.49**	.69		
Problems in regulating smartphone use (3)	3.03	1.4	.74	.74	.50	.60**	.47**	.70	
Money management (4)	3.29	1.09	.81	.82	.53	-.09*	-.07**	-.12**	.73

Note: ns, not significant, * $p < .05$, ** $p < .01$, *** $p < .001$; α , Cronbach's alpha; CR, composite reliability; AVE, average variance extracted; construct correlations, square root of AVEs (on the diagonal).

TABLE 4 Results of hypotheses testing.

DV	IV	Hyp.	β	S.E.	C.R.	R ²
Online shopping addiction	Low self-regulation	H1	.38***	.06	6.57	.41
Online shopping addiction	Problems in regulating smartphone use	H2	.46***	.04	11.54	
Money management	Low self-regulation	H3	-.12*	.05	-2.19	.18
Indebtedness	Online shopping addiction	H4	.16***	.04	3.83	.02
Money management	Online shopping addiction	H5	.01 ^{ns}	.03	.23	
Money management	Indebtedness	H6	-.26***	.02	-12.25	
<i>Moderating effect</i>						
Online shopping addiction	Lack of self-regulation * Problems in regulating smartphone use	H7	.18***	.03	5.23	

Note: ns, not significant; * $p < .05$, ** $p < .01$, *** $p < .001$; Model fit: $\chi^2(164) = 611.45$; CMIN/DF = 3.73; IFI = 0.96; CFI = 0.96; TLI = 0.948; RMSEA = 0.05; 90% CI [0.05, 0.06]; SRMR = 0.05; RFI = 0.932.

Regulation was negatively associated with *Money Management* ($\beta = -.12, t = -2.19, p < .05$), which supported H3. Moreover, with respect to H4, *Online Shopping Addiction* had a positive link to *Indebtedness* ($\beta = .16, t = 3.83, p < .001$). Further, *Indebtedness* had negative association with *Money Management* ($\beta = -.26, t = -12.19, p < .001$), which supported H6. In contrast, the data did not support the direct positive association between *Online Shopping Addiction* and *Money Management* ($\beta = .01, t = -1.22, p = .82$) disclosing H5. However, there was a negative indirect link between *Online Shopping Addiction* and *Money Management* ($\beta = -.04, [CI \text{ lower } -.06, CI \text{ upper } -.03]$). Therefore, the association between *Online Shopping Addiction* and *Money Management* was indirect and mediated through *Indebtedness*. Finally, we assessed the hypothesized interaction effect by introducing the interaction term between the predictor variable and moderator variable in the regression model. With respect to H6, the association between *Lack of Self-Regulation* and *Online Shopping Addiction* was strengthened when *Problems in Regulating Smartphone Use* was stronger ($\beta = .18, t = 5.23, p < .001$).

5 | DISCUSSION

5.1 | Theoretical implications

Our research adds to the understanding of online shopping addiction by showing how the readiness to regulate the repeated stimulation of the digital environment is linked to general self-regulation and related to online shopping addiction. With respect to prior studies (Laran, 2020; Laran & Janiszewski, 2011), our findings illustrate how low self-regulation is linked to a tendency for online shopping addiction. Similarly, our results show how problems in regulating smartphone use is linked to online shopping addiction. This is in line with earlier studies that associate online shopping addiction with arousal and the effect of the digital environment (Jebarajakirthy et al., 2021; May & Irmak, 2014; Rose & Dhandayudham, 2014).

First, we address call by scholars such as Barrera & Ponce, 2021 for more research on how online shopping addiction is associated other constructs such as cognitive overload in form of problems in regulation of smartphone use. Our model contributes to the theory of self-regulation by proposing that the link between low self-regulation and online shopping addiction is stronger in interaction with problems in regulating smartphone use. This finding is consistent with earlier studies that illustrate how the stimuli of the digital environment deplete the resources needed for self-control (LaRose & Eastin, 2002; Rose & Dhandayudham, 2014). Therefore, the distractive effect of a smartphone can be regarded as a primer that unconsciously affects the person's decision making (Laran et al., 2008). Our study also contributes to the addiction literature and ongoing discussion on excessive buying behaviours by approaching online shopping addiction from the perspective of behavioural addictions (Grant et al., 2010; Rose & Dhandayudham, 2014; Zhao et al., 2017). Our findings are in line with the general addiction literature, showing a link between low self-regulation, addictive behaviour (Baumeister, 2002), and harmful

consequences such as financial problems that are typical in monetary addictive behaviours (Oksanen et al., 2018; Wang & Xiao, 2009).

Second, we contribute to the theory of subjective financial well-being by addressing the need for more evidence on how shoppers with compulsive tendencies are less concerned for their financial situation (cf. Lo & Harvey, 2012). With respect to earlier studies, money management is not automated behaviour and is therefore negatively affected by low self-regulation (Muraven & Baumeister, 2000). We also show how online shopping addiction is not directly linked to perceived loss of personal financial control, but the association is indirect and mediated through indebtedness. These findings are consistent with prior studies that have shown compulsive shoppers be less conscious about their personal economy while overspending (Lo & Harvey, 2012). However, when experiencing indebtedness, consumers are likely to be unsatisfied with their money management (cf. Kamleitner et al., 2013).

Third, we address the call for more research on the priming effects of digital environments (Doyen et al., 2012) when investigating Internet-based addictive or compulsive behaviours. Our results show how problems in regulating smartphone use are not only directly associated with online shopping addiction, but it also strengthens the association between low self-regulation and online shopping addiction. This finding implies that constant stimuli of online environment in the form of smart phone notifications further depletes the resources needed for self-control, which makes those young consumers with low self-control prone to online shopping addiction.

5.2 | Practical implications

Instead of stable traits or abilities, we see self-regulation in terms of how people develop, apply, and adapt regulatory skills and strategies (Järvelä & Hadwin, 2013), and these skills must be learnt and taught from an early age. It is also important to learn about the ways that various technologies influence us. Instead of limiting the use of smartphones in education, students should be trained to use them in a productive way with the help of more experienced peers and adults ([anonymized]). Teaching 21st century skills at school is a global trend: Thinking skills and learning how to learn involve also self-regulation in learning (OECD, 2021). This perspective is important because young adults access the Internet through their mobile devices more often than other age groups (OSF, 2021a). It is therefore important that young adults learn how to regulate their mobile phone use.

At school, the young also learn about phenomena such as fast fashion and its societal and environmental impacts (see Kadic-Maglajic et al., 2019). Young people develop their thinking skills and self-reflection to avoid unnecessary shopping. In education, the interest-driven activities of youth should be supported, and they should be encouraged to bring in their cognitive capital from inside and outside of school (Kruskopf et al., 2021). When the strategies and ways of thinking as well as the ICT skills and smartphone use of youth are shared and made overt to discussion, the new generations of citizens may learn important and increasingly responsible consumer skills.

As part of this process, financial skills as well as taking care of oneself are important 21st century skills ([anonymized]). Money management as a critical element of the financial 'dependence to independence' transition in young adulthood is also one of the crucial developmental tasks of this life stage (Shim et al., 2009). Supporting the development of subjective financial skills, especially money management and debt control, is needed especially in the COVID-19 pandemic aftermath as young adults frame their future in the financial and occupational domain (Ranta, Silinskas, & Wilska, 2020).

Besides educators, also companies carry responsibility to prevent young adults' online shopping addiction. Applications are addictive and they are not only constantly accessible, but mobile technology has made applications omnipresent. Since online shopping opportunities are constantly available via smartphone use, there is always easy access to momentary enjoyment, gratification, and an escape from everyday life. Indeed, online shopping addiction is associated with gratification seeking (Wang et al., 2022). Excessive online shopping is also easy to do in secrecy, thus concealing the problematic behaviour from others (Wang et al., 2022). Smartphone, application manufacturers, and online marketers are aware of their responsibility and therefore they should provide usage self-regulation tools to prevent unregulated use of smartphone and online shopping addiction. For instance, according to a VentureBeat blog post by Gabriel (2016), such tools could enable users to limit daily log ins and/or limit total daily time in the application. Similarly, marketers should consider prevention of online shopping addiction while planning their social marketing strategies. Because online shopping addiction is linked to indebtedness, customers' financial and social difficulties caused by addiction may prevent them from forming lasting relationship with the retailer. Therefore, social marketing campaigns could raise awareness of online shopping addiction, reinforce sustainable consumer choices and expenditure, and provide tips and tools to avoid falling for purchase behaviour that may develop to an addiction (Sărghie, 2021).

5.3 | Limitations and future research

This study has certain limitations that leave opportunities for further research, for which our framework serves a platform. First, the use of cross-sectional survey data limited drawing causal interpretations. Future research should enhance the framework with causal relationships by conducting longitudinal studies to tease out these potential effects. Second, while our study provided valuable insight into the young adults' problematic online and financial behaviours during the COVID-19-pandemic, based on cross-sectional data, we are not able to draw conclusions on how the pandemic has affected the studied constructs. For this reason, further research is needed to examine changes in problematic smartphone use and online shopping addiction and how young people perceive control over their personal finances in the post-pandemic world. Besides changes in online behaviour, also socio-psychological factors like fear of future or feelings of hopelessness can affect addictive and problematic online behaviours. By examining these factors alongside self-regulation and problems in

regulating smartphone use, future research could expand the framework for online shopping addiction. Therefore, it is worth studying if other current crises such as climate change or the Russian Invasion in Ukraine have similar effects as the COVID-19 pandemic on addictive and problematic online behaviours. Third, we focused on how problems in the regulation of smartphone use moderate the association between low self-regulation and online shopping addiction. Future research could examine how consumer related factors such as feeling of loneliness, perceived isolation, and fear of missing out (FOMO) explain some of the associations presented in our model. Also, more research should be carried out to examine how other primers of digital environments, such as targeted advertising on social media, together with low self-regulation may have an impact on online shopping addiction. Increased screen time on smartphones (especially on social media) could be a specific metric for this purpose. Fourth, this study is limited to data from the Finnish sample of young adults. Future studies should investigate whether our results replicate across other countries and age groups.

Excessive smartphone use is often conceptualized as a behavioural addiction and treated accordingly (Billieux et al., 2015). Using smartphones is, however, an interpersonal activity and, further, covers various aspects of life. The motives of using smartphones vary from hanging out with friends to gaming and intensive social participation (Hietajärvi et al., 2019; Kruskopf et al., 2021). Marketing on social media makes use of the social networks, cultures, and practices of the youth, including their own role models and heroes (Schwemmer & Ziewiecki, 2018; Thoumrungroje, 2018). In the future, it is important to broaden our scope from self-regulation to shared regulation of consumer activities and to see how different patterns of behaviour spread in young people's social networks (Li et al., 2017).

6 | CONCLUSION

The aim of this study was to investigate young adults' online shopping addiction from the perspective of general self-regulation, problems in the regulation of smartphone use, and money management. Our study makes various contributions to the theories of addictive behaviours, self-regulation, online priming effects, and financial wellbeing. The results supported nearly all our hypotheses, showing that low self-regulation in an online environment facilitates online shopping addiction, which further leads to dissatisfaction toward personal money management through indebtedness. Our findings also revealed how the link between low self-regulation and online shopping addiction is reinforced by the problems in regulating smartphone use. This shows how distractive stimuli of the digital environments can act as primers for behavioural addiction. Moreover, our results revealed the indirect association between online shopping addiction and money management through indebtedness. This finding indicates that compulsive online shoppers are less conscious about their personal economy and only perceive loss of personal financial control when they experience indebtedness.

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CONFLICT OF INTEREST STATEMENT

The authors have no known conflict to disclose.

DATA AVAILABILITY STATEMENT

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

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ENDNOTE

¹ We also tested if the model was invariant between male and female respondents. The results from the chi-square difference test and Δ CFI indicate a significant decrease in fit due to adding in the equality constraints. As a result, we will conclude that we have no evidence of metric invariance between models for male and female respondents.

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APPENDIX A: METHODOLOGICAL DATA APPENDIX

Correlations for all variables used in the analyses.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	1	.56**	.62**	.60**	.71**	.56**	.51**	.70**	.69**	.25**	.35**	.16**	.18**	.30**	.48**	-.15**	0.040	-.02	-.02	.08**
2		1	.59**	.65**	.59**	.60**	.59**	.60**	.61**	.24**	.33**	.22**	.19**	.31**	.38**	-.20**	-.087**	-.11**	-.11**	.12**
3			1	.61**	.67**	.59**	.56**	.61**	.63**	.22**	.29**	.16**	.17**	.26**	.41**	-.19**	-.0039	-.08*	-.06*	.13**
4				1	.66**	.59**	.56**	.64**	.68**	.26**	.32**	.17**	.20**	.29**	.42**	-.16**	-.0042	-.06*	-.06	.10**
5					1	.58**	.56**	.69**	.71**	.25**	.33**	.19**	.22**	.31**	.46**	-.15**	-.0020	-.06*	-.05	.08*
6						1	.59**	.63**	.61**	.28**	.32**	.21**	.19**	.27**	.39**	-.11**	-.0017	-.032	-.02	.09**
7							1	.55**	.59**	.21**	.26**	.15**	.23**	.26**	.37**	-.08**	0.014	.006	-.02	.07*
8								1	.73**	.26**	.36**	.18**	.22**	.28**	.48**	-.16**	.069*	-.025	-.03	.11**
9									1	.29**	.34**	.16**	.21**	.31**	.49**	-.16**	0.026	-.029	-.01	.09**
10										1	.48**	.42**	.24**	.22**	.24**	-.11**	-.071*	-.044	-.06*	.06*
11											1	.49**	.19**	.24**	.31**	-.12**	-.0048	-.01	-.05	.041
12												1	.21**	.22**	.22**	-.14**	-.0048	-.06*	-.06*	.012
13													1	.48**	.35**	-.02	-.0017	.029	.01	.042
14														1	.60**	-.06*	-.0034	-.020	-.03	.004
15															1	-.11**	-.0039	-.024	-.04	.029
16																1	.39**	.46**	.52**	-.32**
17																	1	.57**	.56**	-.27**
18																		1	.59**	-.32**
19																			1	-.32**
20																				1

Note: * $p < .05$, ** $p < .01$, *** $p < .001$; 1 = My productivity for work or study has decreased as a direct result of online shopping; 2 = Online shopping can help me to temporarily forget the troubles in real life; 3 = I have decided to do online shopping less frequently but have not managed to do so; 4 = If I cut down the amount of online shopping in one period, and then start again, I always end up shopping as often as I did before; 5 = I have tried to cut back or stop my online shopping but failed; 6 = When I am not shopping online, I keep thinking about it; 7 = I spend more and more time on online shopping; 8 = Life without online shopping for some time would be boring and joyless for me; 9 = When I cannot do online shopping for certain excuses, I will get depressed or lost; 10 = I have noticed that I have problems handling a big amount of information; 11 = The demands that are expected from me are too high for me to clear them well; 12 = It is difficult for me to judge whether I can handle things well enough; 13 = The notifications on my smartphone disturb my other activities; 14 = I have difficulties in controlling myself because I constantly need to check my smartphone; 15 = I cannot regulate my smartphone use at all; 16 = I feel I can handle my financial situation; 17 = I am satisfied with the way I spend my money; 18 = I am satisfied with the way I manage my financial situation; 19 = I am satisfied with the way I manage my financial situation; 20 = Which of the following statements best describe your indebtedness?