

Unraveling the Influential Mechanisms of Social Commerce Overloads on User Disengagement: The Buffer Effect of Guanxi

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Purpose: Although user engagement has been paid increasing attention, the work on user disengagement is scarce, and little is understood about how overloads elicited by excessive social commerce activities affect user disengagement. Based on the stimulus-organism-response (SOR) framework and psychological reactance theory (PRT), the authors aimed to investigate the effects of social commerce overloads (SCOs) on user disengagement, its influential mechanism, and the buffer effect of guanxi.

Participants and Methods: The authors conducted an online survey to collect the data and then examined our theoretical model and hypotheses. This study employed SPSS 20.0 software and Amos 24.0 software to examine the hypothesized relationships and the model.

Results: Social commerce overloads (ie, information overload (IO), social overload (SO), and communication overload (CO)) positively impact reactance via inferences of manipulative intent (IMI) and compulsive perception (CP); IMI and CP positively influence reactance; IMI, CP, and reactance positively affect user disengagement (ie, neglecting behavior and blocking behavior); guanxi has the buffer effect on the relationship between IMI (CP) and user disengagement, negatively moderates the impacts of IMI on user disengagement (ie, neglecting behavior and blocking behavior), and negatively moderates the effects of CP on blocking behavior but not neglecting behavior.

Conclusion: The findings of this study contribute to the literature on PRT and user disengagement by displaying the effects of excessive social commerce activities on user disengagement and uncovering the buffer effect of guanxi, which can help social e-commerce practitioners better reduce the negative effect of social commerce overloads.

Keywords: social commerce overloads, inferences of manipulative intent, reactance, guanxi, user disengagement

Introduction

The new phenomenon of social commerce overloads (SCOs) that users are often exposed to excessive social marketing information, interaction or messages from their friends (ie, sellers) engaging in social commerce (SC) is on the rise and significantly visible in social media apps,¹⁻³ as technological advances, such as the rise of artificial intelligence generated content (AIGC). Social commerce overloads (SCOs) refer to the extent to which social marketing stimuli from sellers in social commerce exceed users' the processing capability. WeChat has become a dominant social platform in China,⁴ and the problem of excessive social marketing is becoming increasingly prominent. The data from Outbrain⁵ show that social dynamic advertising is the most intrusive type of ad. According to the data from iiMedia Research,⁶ 24% of interviewed users have employed WeChat to conduct product or service promotions, but users' the top two complaints about using WeChat offered by interviewees were excessive social marketing and the abuse of social ads, accounting for 44.9% and 41.2%, far more than other negative troubles, which led to SCOs for social media (eg, WeChat app).^{7,8} In this context, SCOs have become one of the major forces resulting in customer loss.⁴ The ecosystem of WeChat app is established based on acquaintance relations (namely guanxi, in Chinese) among Chinese users, so Chinese users experiencing

excessive ad information, messages or requests from social media (eg, WeChat Moments) tend to neglect or block those marketing stimuli. These cause users' disengagement behaviors (eg, neglecting ad or messages, or clicking the options, such as "Hide his/her posts", "block", "delete and leave") against the negative effect of SCOs elicited by excessive social marketing activities, which disrupts users' experience of SC and obstructs the development of SC. Therefore, it is important and essential for SC practitioners to investigate why and how SCOs elicit user disengagement.

Previous studies on technology overuse have demonstrated that as a critical stimulus, overloads often elicit undesirable outcomes stemming from the undue use of technologies, which has attracted more and more attention from many scholars and managers.^{3,8,9} Existing studies on perceived overload have focused on the effects of environmental stimuli on fatigue,¹⁰⁻¹² dissatisfaction,¹¹ exhaustion and regret,¹³ and discontinuous usage intention (DUI),^{4,11,13-15} but there are still some research gaps on how SCOs elicit user disengagement,¹⁶⁻¹⁹ which needs to conduct further investigation and research. This is because users' psychological processes for SCOs (ie, information overload, communication overload and social overload) on SC apps are diverse. Although overloads have been recognized as hindrances to the development of social commerce, few studies have made initial attempts to uncover the negative sides of using online media to conduct social marketing activities.^{4,13,14} What's more, although more recent studies have verified that cognitive overload and fatigue can trigger users' discontinuous behaviors,^{4,10-12,15} it remains still unclear how the different sub-dimensions of SCOs as stimuli result in user disengagement.⁴

Considering these research gaps, this study is to address two following problems: (1) How do SCOs elicit user disengagement (UD)? (2) Can guanxi alleviate the negative effects of perceived threats to freedom (ie, inferences of manipulative intention (IMI) and compulsive perception (CP)) on user disengagement? To address these research gaps, this study aims to conduct a survey to investigate the effects of SCOs on user disengagement based on the stimulus-organism-response (SOR) framework and PRT and to test the buffer effects of guanxi.

We offer several interesting insights. First, based on the SOR framework and the psychological reactance theory, this study identified the dimensions of SCOs (ie, IO, SO, and CO) as the three kinds of stimuli in the context of SC, extending the findings of Pang & Ruan.^{4,15} Second, prior works have revealed many factors impacting users' discontinuous use intention,^{4,15} the psychological mechanisms that SCOs affect user disengagement have not been clearly explicated until now. This study recognizes IMI, CP and reactance as the three critical stimuli and fresh antecedents of user disengagement, which extends the findings of Pang & Ruan⁴ on overloads. Third, previous studies regard overloads as stressors inducing users' discontinuous intention,^{4,15,20} and this study demonstrates and extends these studies by verifying how different sub-dimensions of SCOs elicit user disengagement. Fourth, we broaden the scope of recent works^{4,10-12,15} and contribute to the literature on PRT by unraveling that IMI, CP and reactance mediate the impact of SCOs on user disengagement. Although most previous studies regard PTF as a single dimension,^{2,21,22} this study offers new insights into the underlying mechanisms of IMI and CP by demonstrating the relationship among psychological reactance factors (ie, IMI, CP and reactance), which enriches and extends the literature on the psychological reactance theory.^{2,21,22} Fifth, we respond to calls for more studies on guanxi in SC context² and empirically demonstrate that guanxi alleviates the effects of IMI and CP on neglecting (blocking) behavior, which enriches the literature on guanxi.²³ Therefore, scholars and practitioners will obtain a deep understanding of why and how SCOs elicit user disengagement in this study.

The following parts are organized as follows. In the 2nd part, the literature review of SCOs and UD are presented. In addition, we develop related hypotheses and research model in the 3rd part. Then, the 4th part shows research design and the method of collecting data. Followed by analyzing data in the 5th part. Finally, this study discusses results, implications, and limitations in the 6th part.

Literature Review

The Stimulus-Organism-Response (SOR) Framework

The SOR framework offers a structured framework of factors for our research that impact user disengagement for SCOs on SC app. We employ the framework to forecast that environmental factors (stimulus), spur changes on cognitive and effective process of individuals (organism), and further affect their behavior styles.^{24,25} Firstly, stimulus refers to the external factors eliciting changes of internal states of individuals.²⁶ Secondly, organism is the internal cognitive and

affective states intervening the effect of stimulus on responses of individuals.²⁶ Thirdly, responses reflect the final behavioral intention or actual behaviors of individuals responding to various stimuli.²⁴ Drawing on the framework, our study explores the three types of environmental stimuli (ie, SCOs) that could impact the cognitive and affective states of organism (ie, IMI, CP and reactance), which in turn elicits user disengagement (UD) in the SC context.

Social Commerce Overloads as Environmental Stimuli (S)

Previous studies on technology overuse have demonstrated that as a critical stimulus, overloads often induce undesirable outcomes owing to the undue usage of technology.^{3,8,9} Grounded in the person-environment fit theory, the mismatch between environmental needs and personal coping abilities leads to overload.²⁷ The definitions and sub-dimensions of perceived overloads vary with different context and subjects. Previous studies have found that technological overloads involve information overload (IO), communication overload (CO) and system feature overload (SFO).²⁸ Social media apps have much simpler system features that users can employ and control easier,⁹ but SFO will not happen in our study. First, with the continuous improvement and development of user-friendly-access social media apps, social platforms can provide increasingly easy-to-use system features and be less time-consuming. Second, as users will grow more and more skilled in employing social media apps, SFO is no longer a problem for users.²⁹ Therefore, we employ SO to replace SFO to fit the SO context of our research extending the existing studies.^{13,14}

In our study, social commerce overload (SCO) is defined as an overburdened social marketing environment and the extent that social marketing stimuli from providers (eg, friends engaging in SC) exceed users' the processing capability and lead to three kinds of overloads (ie, IO, CO and SO). (1) IO refers to the extent that the excessive information exceeds consumers' information processing capabilities.^{30,31} (2) CO refers to the extent that the communication demands from social commerce platform exceeds communication capabilities of users.³² These excessive interruptions during users' task (eg, working or learning) lead to produce less.²⁸ Distinct from IO that emphasizes the conception of excessive information processed by users, CO involves the interrupts and frequent unintended communication triggered by others (eg, providers or friends engaging in social marketing). Considering the overuse of social media at work or studying, both of the overloads involve social marketing activities at everyday life. However, the catholicity of SC has permeated many aspects of users' social life into their work scenario. (3) SO refers to the degree to which social requests surpass the level that individuals can handle comfortably, and the absence of control over social context emerges over negative stimuli (eg, excessive social ads).⁹ As excessive requests for enacted social support on SC apps surpass the level that users can be willing or comfortable to offer, users may feel the loss of control over them and regard these requests as burdens for them,³ which leads to SO.

In social e-commerce, three types of SCOs may occur, inducing negative behavioral outcomes from social media usage (eg, user disengagement). Therefore, we will investigate the effects of SCOs elicited by excessive social marketing activities on user disengagement.

Perceived Threats to Freedom in Social Commerce

Clee & Wicklund³³ noted that perceived threats to freedom (PTF) will occur when an influencer or control promotes them to change under the pressure. PTF can rouse reactance of individuals.³⁴ The construct of PTF is an essential part of the Psychological Reactance Model examined in IS research, which is measured with one scale.^{2,21} The viewpoint that SCOs (eg, excessive social ads and interaction) threatened users' freedom to consume social media content has still not been empirically verified in previous advertising studies. Drawing on the findings of Mou & Ji,⁷ we argued that the threat to freedom in the SC context perceived by individuals can be divided into two sub-dimensions: (1) inferences of manipulative intent (IMI); (2) compulsive perception (CP).^{7,35,36} First, IMI is defined as consumer inferences in which marketers are trying to prevail on them by means of inappropriate, unfair, and manipulative way.³⁷ Based on the Persuasion Knowledge Model (PKM), consumers' persuasion knowledge consists of their experiences and cognition of persuasion.³⁸ Once activating persuasive knowledge, individuals may suspect seller's ulterior motives and ad claims, perceiving firms or sellers being manipulative or deceptive, and further leading to one's reactance to persuasion.³⁹ When sellers (friends) post excessive SC information, which can initiate users' persuasive knowledge structure, cause their skepticism toward the motivation of sellers posting information behaviors, and induce IMI and behaviors of users.^{40,41}

The easier and faster the persuasive knowledge of users will be activated by excessive SC information, the more IMI is perceived by them. Wang & Cheng³⁵ contended that IMI is one of the important factors initiating psychological reactance. Mou & Ji⁷ demonstrated that IMI, as one sub-dimension of PTF, negatively affects acceptance intention on WeChat sellers pushing information behaviors. Second, Edwards et al⁴² defined CP as the psychological cognitive response formed when information processing process is forced to interrupt in consumers' cognitive processing. Mou & Ji⁷ found that as one dimension of PTF, CP negatively affects acceptance intention for ad information. Users often spend too much time in processing the unwanted and excessive business information, which make users perceive pressures stemming from processing excessive ad messages or information from friends. This threatens their freedom to read the content of ads and will cause their CP. Therefore, we try to address the limitation by distinguishing the effects of the sub-dimensions (namely IMI, CP) of PTF on reactance and further explore the effects of the two sub-dimensions on user disengagement.

Psychological Reactance Theory

Psychological reactance theory (PRT) illustrates how individuals cherish their freedom to choose, and why they react negatively to threats.^{43,44} When encountering threats to their freedoms, individuals tend to act against these threats.⁴⁵ The inclination is regarded as psychological reactance (PR).³⁴ In the context of SC, threats involve in attempted interpersonal influences. Therefore, psychological resistance could be mainly elicited by compulsive perception (CP) and inferences of manipulation intent (IMI).³⁵ Previous studies on manipulative intention have stemmed from Persuasive Knowledge Model (PKM).^{7,46} The persuasive knowledge is the information that marketers are employing to convince individuals, and the inference of this motivation is IMI. Consumers could infer what others attempt to achieve (their motives or intentions) and how they try to achieve the goal (their tactics or strategies). When observers infer that others have ulterior motives for the behaviors, they may perceive these behaviors as manipulative,⁴⁷ and thus conduct behavioral disengagement,⁴⁸ which represents someone's inference of others' manipulative intent and its results.² Brehm⁴⁹ regarded psychological reactance (PR) as a drive to reestablish the threatened personal freedoms. Brehm & Brehm³⁴ argued PR as a motivational state that reactance will happen while some freedom is threatened or removed with elimination.

SC sellers offer excessive ads or messages continuously to their target users for advocating them to participate in social shopping under social pressure, which may elicit SCOs (ie, IO, SO and CO) and users' psychological reactance. Thus, we apply the PRT as a theoretical basis to investigate how SCOs affect user disengagement via psychological reactance.

Guanxi

According to the social network theory, guanxi, a Chinese concept, is viewed as a social capital in China,⁵⁰ focusing on interpersonal relationships and connections grounded in Confucian traditions.^{51,52} Guanxi refers to "a close and pervasive interpersonal relationship based on high-quality social interactions and the reciprocal exchange of mutual benefits".⁵³⁻⁵⁵ It roots in collectivism that lays stress on the importance of cohesiveness among people.⁵⁶ Merchants or individuals in China put guanxi into practice as an art by interactions with others to establish, maintain and enhance their interpersonal relationships with distinct individuals or organizations,^{55,57} including favor exchange, socializing, gift-giving and other ways with the goals of enhancing the factors of ganqing (relations in Chinese), renqing (favor in Chinese), and xinren (trust in Chinese).⁵⁸ Thus, guanxi is able to facilitate business transactions through lubricating trade partner relations with social ties.⁵³

Guanxi is often employed to fight against inadequacies in the regulatory environment. To maintain the guanxi with others, favors given by them produce an obligation that may need to be paid back in the future.⁵⁹ Guanxi is a personal relationship that connects trading partners by exchanging mutual obligations reciprocally,⁶⁰ which has its special features being distinct from western relational exchange:⁶¹ (1) Guanxi is a private relationship established by reciprocal exchange of favors, commitment and mutuality in SC;⁶² (2) Morality (social norm) is the instructive principles of guanxi,⁶² while the instructive principle of relational exchange in western societies is legality or rules.⁶³ Third, it has no effect on individuals of outside social networks or groups, but the network in relational exchange is open to anyone of partners.

According to the Guanxi theory, establishing guanxi with customers in China could improve their relationship to service providers.⁶⁴ However, the literature on how guanxi moderates PTF on user disengagement is scarce.

User Disengagement in Social Commerce

Early works have found that disengagement involves the extent to which users withdraw and disconnect from social systems, but the works on disengagement in SC context are sparse.¹⁹ Disengagement is explored in buyer–seller studies and may happen at the stage of the relationship.⁶⁵ The definition of disengagement will vary depending on researchers with application domains.⁶⁶ Chesney et al⁶⁷ argued that disengagement behaviors against stress agents include ignoring strategies and banning strategies. Goode⁶⁸ noted that disengagement involves avoiding or downplaying stress factors so that individuals can be taken away from the negative effects. Khac et al⁶⁶ viewed disengagement as the psychological process leading to relationship termination elicited by negative events. Existing studies on disengagement have focused on the definition,⁶⁹ the types,^{2,67,70} and coping strategies.^{42,68} However, only few studies have explored user disengagement responses of SC activities.

In the traditional ad context, customers are often passive receivers of advertising information, and are apt to be impacted,⁷¹ but emerging ad channels (eg, social media) enable them a power transfer from passive receivers to positive communicators or interactors. Extensive research has investigated the definition of engagement and its related factors,^{19,72,73} but the works on the antecedents of disengagement and their effects in the social ad context are still scarce (see Table 1).^{17,19}

Tripathi et al¹⁹ defined disengagement as a psychological state in which subjects withdraw from the focal object” and regarded it as an active withdrawal from engagement. Existing studies on ad avoidance focused on active ad avoidance and overlooked the positive effect of blocking ads, but users may still experience disengagement without actively avoiding ads.^{17,19} We argued that different dimensions of user disengagement (UD) in studies are behavioral and that they represent users’ different responses or experiences when facing SCOs. To state the constructs reasonably and precisely, drawing on the method of Goode⁶⁸ and Bowden et al,⁶⁹ we propose the concept of UD to capture how users behave by the way that reflects their disconnection or withdrawal to ad information or their WeChat friends who engaging in SC (ie, WeChat sellers).

In our study, user disengagement refers to the extent to which users withdraw or disconnect from sellers engaging in SC and from social media. We conceptualize user disengagement as the types of resisting or reacting against SC interaction activities and rejecting the participation of SC activities. User disengagement is cognitive, psychological and behavioral, which differs from other definitions that are consisted of cognitive and psychological dimensions.^{19,76} To restore users’ freedom of information use or social interaction, WeChat offers some selectable options. For example, a WeChat user can choose “Mute notifications” (eg, pretending not to see messages or ignoring messages from friends temporarily) (see Figure 1), ‘Hide his/her posts’ (not viewing his or her ‘moments’) (see Figure 1), ‘Block’ (not receiving any information from him or her), ‘Delete and leave’, and so on.

Table 1 Related Studies on User Disengagement (UD) in the SC Context

Authors	Findings
O'Brien et al ¹⁷	The work on UD is sparse, and UD is a means to address problematic technology use, often involving ceasing use or withdrawing time or energy of users.
Yan et al ⁷⁴	Employing ad blockers positively impacts quantity and variety of news consumption.
Vatavwala et al ¹⁶	UD involves dormancy, termination, and acrimonious exit.
Matthes et al ¹⁸	UD is the results of negative interactions with technologies, and involves pausing or ceasing apps or taking a break from devices.
Tripathi et al ¹⁹	UD involves the more willful and active withdrawal of users, and consumer skepticism positively impacts advertising disengagement.
Chellasamy et al ⁷⁵	No studies have thoroughly investigated the construct, antecedents and outcomes of UD.

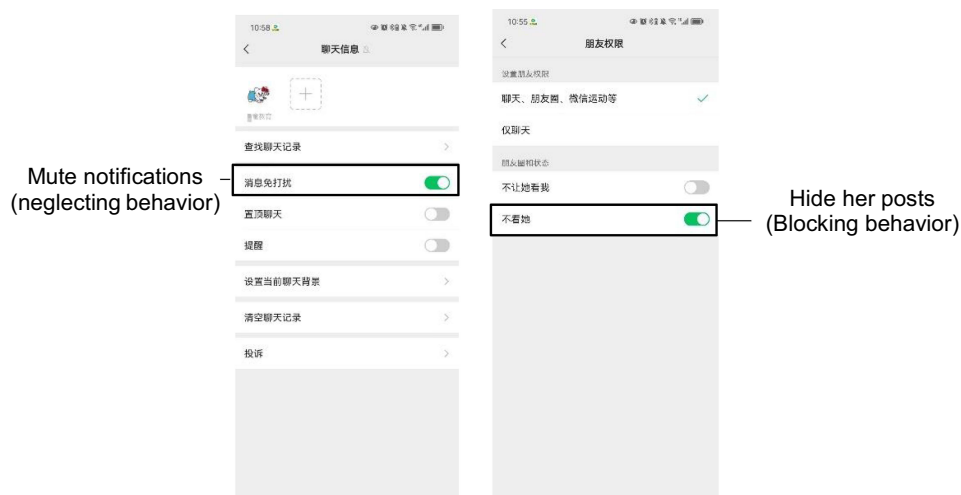


Figure 1 The screenshots of user disengagement.

Drawing on the method of Molden et al⁷⁷ that they classified the experiences of social exclusion into being ignored and being rejected, we divided these acts into two types of user disengagement: neglecting behaviors and blocking behaviors. (1) Neglecting behaviors are the passive acts that users employ to receive but not to see or ignore deliberately any messages or posts from friends engaging in SC by employing the options (eg, “mute notifications”). (2) Blocking behaviors are the active acts that users employ to reject to receive any messages or posts from friends engaging in SC, by employing the options “Hide his/her posts”, “Complaints”, “Block”, and even “Delete and leave”. O’Brien et al¹⁷ also found that UD is a means to address problematic technological use (including quitting social media sites) when users take excessive time to employ them.

Research Model and Hypotheses

Psychological reactance theory (PRT) argued that individuals cherish their freedom to choose, and that they will react negatively to threats.^{43,44} When encountering threats to their freedoms, individuals tend to act against these threats,⁴⁵ namely psychological reactance (PR).³⁴ In SC context, SC sellers offer excessive ad information or social requests continuously for their target users to promote them to participate in social shopping under social pressure, which may elicit SCOs (ie, IO, SO and CO) and users’ psychological reactance, and ultimately lead to user engagement. Thus, we apply the PRT as a theoretical basis to investigate how SCOs affect user disengagement via psychological reactance.

Based on the SOR framework and PRT, this study takes IO, SO and CO as independent variables (IVs), IMI, CP and reactance as mediators, guanxi as the moderator, and user disengagement (ie, neglecting behavior and blocking behavior) as dependent variables (DVs). Based on the SOR model, this study treats SCOs (ie, IO, SO and CO) as stimuli (S), regards IMI, CP and reactance as organisms (O), and views user disengagement (ie, NE and BL) as responses (R). [Figure 2](#) illustrates our model.

Social Commerce Overload (S) and Reactance (O)

Users are exposed to diverse kinds of information on social media, such as personal lives, advertisements, news, and other information, while the tremendous amounts of information is rapidly generating and spreading in social media networks. When the excessive information exceeds consumers’ information processing ability, IO will occur, and may produce stress and negative emotion.⁷⁸ When WeChat sellers post excessive SC information, which will initiate users’ persuasive knowledge structure, cause their skepticism toward the motivation of WeChat sellers posting information behaviors, and induce the IMI and behaviors of users.⁴¹ The easier and faster the persuasive knowledge of WeChat users will be activated by excessive SC information, the more IMI is perceived by them. Sellers post constantly product information in WeChat Moments, induce and manipulate users to pay attention to it, and buy their products.⁷ These make

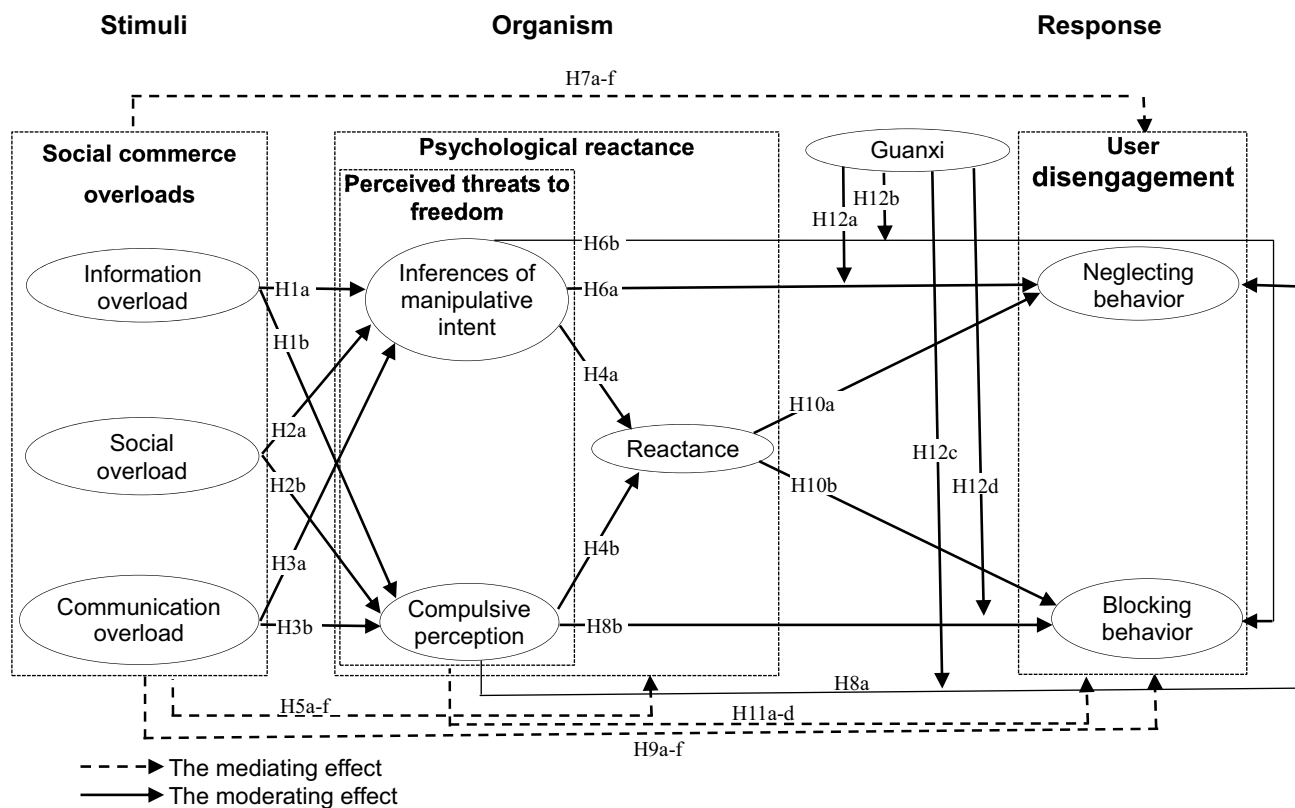


Figure 2 Research model.

users feel that the purpose of excessive ad information posted by sellers is unreliable, and that these friends have the motivation to manipulate intentionally them to behaving, such as inducing them to purchase their products. Therefore, we posited:

H1a: Information overload positively affects inferences of manipulative intent.

Previous studies showed that IO leads to negative outcomes, including stress, fatigue, exhaustion and regret,^{13,32} which makes users feel compelled to process the vast information that exceeds their processing capacity and will generate a feeling of losing control.¹¹ Cao & Sun¹³ discovered that IO positively affects users' exhaustion and regret. Social commerce sellers may post excessive ads to consumers for different business motivations in SC, which forms pressure for consumers, and makes them feel overwhelmed. These behaviors are easy to disturb consumers and threaten their free perception, and consumers feel forced to receive, read, and repost mass information, or then to purchase products. Therefore,

H1b: Information overload positively affects compulsive perception.

Social media allows people to connect each other with high frequencies regardless of when and where, and the continuous and extensive exposure to excessive SC ads and intensive social interactions causes users to feel that they provide excessive social supports to other people.¹³ When WeChat sellers conduct excessive social interactions with users, including social interactions or requests from then (eg, are you here? Please help me to win a discount if you are my friend), which can initiate users' persuasive knowledge structure, cause their skepticism toward the motivation of social interactions or requests initiated by SC sellers, and induce the IMI of users.⁴⁰ Sellers conduct constantly social interaction activities in WeChat Moments, induce and manipulate users to pay more attention to or to purchase their products owing to social norms.⁷ The more social interactions or requests are conducted, the easier and faster their

persuasive knowledge of users will be activated, and the more IMI is perceived by users. These make users feel that the purpose of excessive social interaction and requests are unreliable and dishonest, and that their friends have the motivation to manipulate intentionally them to behaving.⁷ Therefore, we hypothesize:

H2a: Social overload positively affects inferences of manipulative intent.

SO involving abundant and superfluous social demands will cause psychological distress.¹¹ This perception occurs when social requests transcend users' processing capacity. SO is triggered by social norm pressure, and people offer social support to their friends of social network,⁷⁹ but users have to bear the pressure or burden of excessive social support owing to conforming with the social norm.⁸⁰ It involves compulsive use of social network websites or compulsive shopping, which contributes to social exhaustion and stress,⁷⁹ and enhances the CP. Therefore,

H2b: Social overload positively affects compulsive perception.

According to the human interruption theory, CO will occur when excessive messages disrupt routine work.⁸¹ During a continuous communication, excessive communication may elicit the conflict between communicative requests and cognitive ability of users.¹³ Superfluous communication could distract consumers' attention and interrupt their work at hand owing to the scattered attention and may drive them to receive advertisements, share shopping knowledge or experience, repost the hyperlink of advertisements and even buy products.^{7,32} These frequent interruptions may cause it difficult to concentrate and may make users standstill their tasks at hand,⁸² and consumers often feel that sellers (friends) are inducing and manipulating them to pay close attention to or to purchase their products.⁷ Therefore, we hypothesize:

H3a: Communication overload positively impacts inferences of manipulative intent.

CO may lead to process undesirable and too much requests.³² Owing to too much communication and interruption, consumers are not able to focus on their primary work at hand and have to spend excessive time and energy on unnecessary communication. Ou & Davison⁸³ argued that employee needs 11 min to go back to the concentration state. Furthermore, excessive communication leads to more social network fatigue and enhances the level of stress of users to comply with the posted information of sellers,^{7,32} which brings pressure or CP to bear on users. Therefore, we hypothesize:

H3b: Communication overload positively affects compulsive perception.

Perceived Threats to Freedom and Reactance

PTF can trigger individuals' reactance.³⁴ According to PRT, reactance will occur when users are exposed to forceful or persuasive messages, and they will act against or change their attitude or behaviors proposed in the messages to restore threatened freedom.⁸⁴ In SC context, the threat to freedom in SC perceived by individuals mainly includes (1) IMI; (2) CP.^{7,35} Bleier & Eisenbeiss⁸⁵ discovered that ad personalization depth will positively affect reactance. Verlegh et al³⁶ argued that reactance is often elicited by manipulative intent and forced exposure. Youn & Kim² also pointed out that PTF positively impacts on reactance. Thus:

H4a: Inferences of manipulative intent positively influence on reactance.

H4b: Compulsive perception positively impacts on reactance.

H5a-c: Inferences of manipulative intent mediate the effects of IO (a), SO (b), and CO (c) on reactance.

H5d-f: Compulsive perception mediates the effects of IO (d), SO (e), and CO (f) on reactance.

Psychological Reactance and User Disengagement

According to PRT, when individuals' freedom is threatened or restricted by forceful and excessive messages at persuasion, they may be inclined to restore it. Reactance will occur when users are exposed to persuasive messages, and they will take actions or change the attitude or behavior to retrieve their freedom,⁸⁴ which may lead to user disengagement. User disengagement is defined as users' withdraw or disconnect from friends engaging in SC (ie, WeChat sellers) and from social media, involving neglecting behavior and blocking behavior.

Lunardo & Mbengue⁸⁶ discovered that the more users perceive manipulative intention, the less they attribute integrity to retailers. Wang & Cheng³⁵ contended that IMI is one of the important factors initiating psychological reactance. Mou & Ji⁷ demonstrated that IMI negatively affects acceptance intention on WeChat sellers posting information behaviors. Youn & Kim² insisted that PTF negatively affects cognitive ad avoidance and positively impacts behavioral ad avoidance. When PTF of choice is intense, consumers are inclined to regain the freedom by ignoring ads and blocking ads,⁴⁸ which is consistent with prior work's findings that IMI negatively impacts on acceptance intention to services or ads.^{2,7,35} Ads may lead to user disengagement, when ads interrupt users' objectives to employ social media.² Our study focuses on two kinds of user disengagement: neglecting behavior and blocking behavior.^{2,87} Neglecting behavior is the extent that users are passive to receive but not to see or to neglect ad information or messages. Blocking behavior is the extent that users are active to take actions to reject social interactions and to block ads or messages of SC activities. Lang⁸⁸ proposed that the aversive motivational system helping to grapple negative environmental stimuli can be employed to explain avoiding behaviors (eg, ad avoidance). As negative stimuli or aversive activation increases, people can employ more mental resources to work out what can be done to avoid danger or threat,² including neglecting (blocking) excessive ads or social interactions.

Excessive social ad post or messages, communication, and social interaction posted by sellers may activate the system, because excessive ad information or social interaction threaten users' aims of using social media at their free will. The enhanced activation will lead to user disengagement. When users are exposed to excessive ads, communication, or social interaction, they will regard these as threats to their freedom (eg, being induced to purchase unwanted products or to repost ads or to provide too much social support), which will make them feel manipulative intent of sellers. And these users would break out the excessive ads or conduct some measures to ignore or block excessive ads in the future.⁸⁸ To avoid the threat of the ads or messages, users are active to block them (eg, blocking or hiding them). Distinct from neglecting behavior, users put in more effort to handle excessive social ads. Following the logic, we predict the following hypothesis:

H6a-b: Inferences of manipulative intent positively impacts neglecting behavior (a) and blocking behavior (b).

H7a-b: IMI mediates the impact of IO on neglecting behavior (a) and blocking behavior (b).

H7c-d: IMI mediates the impact of SO on neglecting behavior (c) and blocking behavior (d).

H7e-f: IMI mediates the impact of CO on neglecting behavior (e) and blocking behavior (f).

Previous studies show that CP negatively affects behavioral intention.^{7,35} Edwards et al⁴² defined CP as the psychological cognitive response formed when information processing process is forced to interrupt in consumers' cognitive processing. Once consumers have formed CP of posting behaviors, this will negatively impact their cognitive, emotion and behaviors.⁷ Graupmann et al⁸⁹ pointed out that ads posting behaviors of enterprises will interfere with consumers and threaten consumers' perception of freedom. As CP of ads is perceived intrusive based on the PRT⁹⁰ when users are forced exposure to ad information.⁹¹ To regain threatened or lost freedom, users may resist the forced ad exposure or engage in persuasive boomerang including ad avoidance.^{84,92} Mou & Ji⁷ found that CP negatively affects acceptance intention for ad information. Sellers keep continuously releasing the related product information in their circle of friends which WeChat users do not want to see in browsing the messages in WeChat Moments, and users perceive that the information is exposed to them.⁷ Users often spend too much time to process the unwanted and excessive information, communication, or social interaction, which make them perceive the excessive messages or ads threatening

their freedom to read the content of ads, and will cause their CP. The CP will negatively affect their attitude and behavioral intention.⁷ Youn & Kim² also pointed out that PTF negatively affects behavioral ad avoidance (eg, blocking ads). Cho & Cheon⁹³ argued that blocking behavior is the extent that users are active to take actions to reject social interaction and to avoid or block ads or messages of SC activities. Following the logic, we propose the hypothesis:

H8a-b: Compulsive perception positively impacts neglecting behavior (a) and blocking behavior (b).

H9a-b: Compulsive perception mediates the effect of IO on neglecting behavior (a)/blocking behavior (b).

H9c-d: Compulsive perception mediates the effect of SO on neglecting behavior (c)/blocking behavior (d).

H9e-f: Compulsive perception mediates the effect of CO on neglecting behavior (e)/blocking behavior (f).

According to PRT, when persuasive messages or information interfere with users' objectives or limit their threatened freedom to enact, reactance will occur.⁹⁰ To regain or restore the freedom, people may engage in resisting the persuasive messages or behaving as opposed to the intention of the messages.^{84,92} Previous studies show that personalized ads are able to cause customers to feel manipulated or threatened on their freedom to choose while perceiving an individualized ad excessively close to their needs,⁹⁴ which cause reactance, a psychological state that people are being motivated to regain their freedom to choose through behaving opposed to the intention of the ads.⁹⁴ Reactance is able to provoke the responses of restoring freedom that cause people to reject messages or ads.⁹⁵ When being exposed to excessive ad messages, users intend to be engaged in resistance and avoidance.^{93,96} Ham⁹⁶ pointed out that psychological reactance leads users to cope with ad avoidance. Ahn & Ham⁹⁷ found that PR mediates the relationship between advertising options on ad attitude. Tripathi et al¹⁹ also noted that consumer skepticism positively impacts advertising disengagement. If users are forced to expose to excessive ads or messages, and will feel unfair, they would conduct neglecting behavior or blocking behavior to restore freedom. Thus, we propose:

H10a-b: Reactance positively impacts on neglecting behavior (a) and blocking behavior (b).

H11a-b: Reactance mediates the impact of IMI on neglecting behavior (a) and blocking behavior (b).

H11c-d: Reactance mediates the effect of compulsive perception on neglecting behavior (c) and blocking behavior (d).

The Buffer Effects of Guanxi

Previous studies on guanxi noted that it has theoretical basis in Confucianism in China.⁹⁸ Generally, Chinese people value responsibility and obligation while engaging in interactions with family members, but they emphasize reciprocity and doing favors for others while engaging in interactions with familiar people or friends.⁹⁹ Users with high-level guanxi value reciprocity tend to capture relationship harmony, including conflict avoidance,⁵³ but those with low guanxi do not. When encountering excessive ads or messages, users with low guanxi are more likely to inference that persuasion from friends with the inappropriate and manipulative means, such as ads, messages and posts. When high-guanxi users are exposed to excessive social ads or messages, they have to provide social support for friends (sellers) to maintain harmonious relationship between them, including reading ads, liking, and doing favors for friends. They could repost the ads, and purchase products from these friends rather than neglect or block ad information or interactions. Considering the importance of guanxi in SC, we propose the hypothesis:

H12a: Guanxi negatively moderates the impact of IMI on neglecting behavior.

H12b: Guanxi negatively moderates the impact of IMI on blocking behavior.

H12c: The effect of compulsive perception on neglecting behavior is moderated by guanxi.

H12d: The effect of compulsive perception on blocking behavior is moderated by guanxi.

Research Methodology

Measurements

This study conducted an online survey to examine our theoretical model and hypotheses. To measure our nine constructs in the research, this study adopted these scales from existing studies on different constructs. This study modified these items according to the background of this study to fit our study: IO, adapted from Zhang et al¹¹ and Yu et al;⁹ SO, adapted from Maier et al;¹ CO, adapted from Yu et al;⁹ IMI, adapted from Cotte et al¹⁰⁰ and Lunardo & Mbengue;⁸⁶ compulsive perception, adapted from Edwards et al⁴² and Mou & Ji;⁷ reactance, adapted from Youn & Kim² and Ringler et al;¹⁰¹ guanxi, adapted from Shao & Pan;¹⁰² neglecting behavior, adapted from Cho & Cheon;⁹³ blocking behavior, adapted from Cho & Cheon.⁹³ The well-developed scales were drawn and used from the scales in the extant studies, utilizing a 7-point Likert scale. All the variables were measured by using a 7-point Likert scale ranging from 1 = “completely disagree” to 7=“completely agree”.

Since this survey was carried out in China, we adopted the forward-backward translation approach, and made sure that Chinese items were accurate to illustrate the meanings of the scales. Besides, the questionnaire was pretested involving 52 university students in China. Based on feedbacks from the students participating in the pretest, we revised and finalized the items by optimizing ambiguous expressions.

Sample and Data Collection

Data collection was conducted by employing a survey in Chinese. Researchers conducted the online survey on WeChat app for four weeks and sent inviting messages and hyperlinks of the questionnaire to friend groups and their WeChat Moment. Researchers employed convenience sampling, being in line with the sampling method used by many scholars investigating technology overuse.^{4,8,13–15,30,103} Informed consent was obtained from all the participants in this study, and participants were assured of confidentiality and anonymity of the information relating to the survey. This study was conducted in accordance with the guidelines of the Declaration of Helsinki. Each respondent was offered a random red envelope with RMB 0 to 500 prizes (by which people can employ to send electronic money to other friends by transferring it from one account to another) after completing the survey. An initial screening method was used to ask respondents whether they had the experience of being forced to read ad information or being pleased to purchase products provided by friends engaging in social commerce on WeChat app. To make sure that everyone participated in the survey only once, we checked the Internet Protocol address of each respondent.

A total of 489 users participated the survey, and 406 valid samples were returned to conduct further data analysis. Table 2 shows an overview of demographic information of the respondents. Among the 406 participants, 50.2% were males and 49.8 were females, which was approximate to the data of iiMedia Research¹⁰⁴ showing that 49.1% of WeChat users are females, and 50.9% are males. About 75.8% of the participants were 18–35 years old, which is almost consistent with the findings of iiMedia Research¹⁰⁴ that 77.6% of WeChat users aged 35. Over 68.7% held a bachelor's degree or a higher level of education in our study. With respect to the monthly disposable incomes of participants, 63.3% earned below RMB 5000 every month. The percentage was approximate to the findings of iiMedia Research¹⁰⁴ that the monthly disposable income of 61.2% of WeChat users was below RMB 5000 every month in 2019.

This study conducted the non-response error estimation through comparing the means of every construct and demographics for early and late participants. No significant differences between them were discovered, indicating that non-response bias did not exist.

Data Analysis and Results

Following the method adopted by Pang & Ruan,^{4,15} this study employed the structural equation modeling (SEM) approach to conduct the hypothesis test. This is because it facilitates us to validate the survey data and to examine the relationships among the constructs.^{4,15} Moreover, by using the approach, we can employ the unitary paradigm with multiple IVs to calculate multiple DVs but not analyze each IV respectively.⁴

Table 2 Demographics Information (N = 406)

Characteristics	Frequency	Percentage (%)
Gender		
Male	204	50.2
Female	202	49.8
Age		
18–25	158	38.9
26–35	150	36.9
36–45	86	21.2
>46	12	3.0
Education		
≤High school/professional high school	36	8.9
College	91	22.4
University degree	237	58.4
≥Graduate degree	42	10.3
Monthly disposable Incomes(RMB)		
<1000	88	21.7
1001–3000	82	20.2
3001–5000	87	21.4
5001–7000	93	22.9
>7001	56	13.8
Usage experience with WeChat		
<1 year	53	13.0
1–2 years	91	22.4
3–4 years	118	29.1
>4 years	144	35.5

Reliability and Validity

To examine the measurement model, this study employed SPSS 20.0 software and Amos 24.0 software to examine the reliability and validity of the constructs. Table 3 shows that the Cronbach's α of all the constructs was 0.801 to 0.957, exceeding the threshold value of 0.7 with high internal consistency.¹⁰⁵ We used a confirmatory factor analysis (CFA) to measure reliability and validity. In our study, these skewness and kurtosis values of the nine constructs in our model were between -2 and $+2$ or close to zero, indicating that data were normal.¹⁰⁶

The χ^2 of the measurement model was 1215.499 with 593 df. The results of the CFA suggested the data fit is acceptable ($\chi^2/df = 2.050$, CFI = 0.943, TLI = 0.936, AGFI = 0.820, IFI = 0.943, RMSEA = 0.051 < 0.08, and SRMR = 0.029 < 0.05). In Table 3, the standardized factor loadings were greater than 0.7 and were significant at the 0.001 level,¹⁰⁵ ranging from 0.711 to 0.861. Construct reliability (CR) was assessed to evaluate composite reliability. The CRs of all the constructs, as shown in Table 3, exceeded 0.7, which indicated good reliability.¹⁰⁷

Table 3 Confirmatory Factor Analysis Result of All the Constructs

Variable	Item	Loading	CR	AVE	CA
Information overload (IO)	IO1	0.781	0.843	0.641	0.842
	IO2	0.813			
	IO3	0.808			
Social overload (SO)	SO1	0.773	0.801	0.573	0.801
	SO2	0.770			
	SO3	0.726			
Communication overload (CO)	CO1	0.794	0.837	0.632	0.834
	CO2	0.855			
	CO3	0.730			
Inferences of manipulative intent (IMI)	IMI1	0.795	0.810	0.588	0.810
	IMI2	0.791			
	IMI3	0.711			
Compulsive perception (CP)	CP1	0.779	0.892	0.622	0.891
	CP2	0.837			
	CP3	0.818			
	CP4	0.727			
	CP5	0.779			
Reactance (PR)	PR1	0.712	0.845	0.522	0.845
	PR2	0.726			
	PR3	0.735			
	PR4	0.719			
	PR5	0.721			
Guanxi (GX)	GX1	0.833	0.957	0.710	0.957
	GX2	0.817			
	GX3	0.832			
	GX4	0.852			
	GX5	0.822			
	GX6	0.855			
	GX7	0.861			
	GX8	0.859			
	GX9	0.853			

(Continued)

Table 3 (Continued).

Variable	Item	Loading	CR	AVE	CA
Neglecting behavior (NE)	NE1	0.790	0.836	0.629	0.832
	NE2	0.828			
	NE3	0.760			
Blocking behavior (BL)	BL1	0.812	0.834	0.626	0.832
	BL2	0.812			
	BL3	0.747			

Abbreviations: CA, Cronbach's α ; CR, composite reliability; AVE, average variance extracted.

Table 4 Discriminant Validity of Measures Used in Measurement and Correlation Matrix

	Mean	1	2	3	4	5	6	7	8	9
IO	5.700	0.801								
SO	5.463	0.632	0.757							
CO	5.376	0.588	0.600	0.795						
IMI	5.502	0.674	0.642	0.642	0.767					
CP	5.551	0.656	0.660	0.630	0.684	0.789				
PR	5.433	0.662	0.676	0.592	0.676	0.655	0.722			
GX	2.969	-0.499	-0.523	-0.463	-0.522	-0.565	-0.566	0.843		
NE	5.521	0.582	0.622	0.592	0.711	0.666	0.685	-0.501	0.793	
BL	5.553	0.648	0.628	0.564	0.635	0.675	0.671	-0.584	0.603	0.791

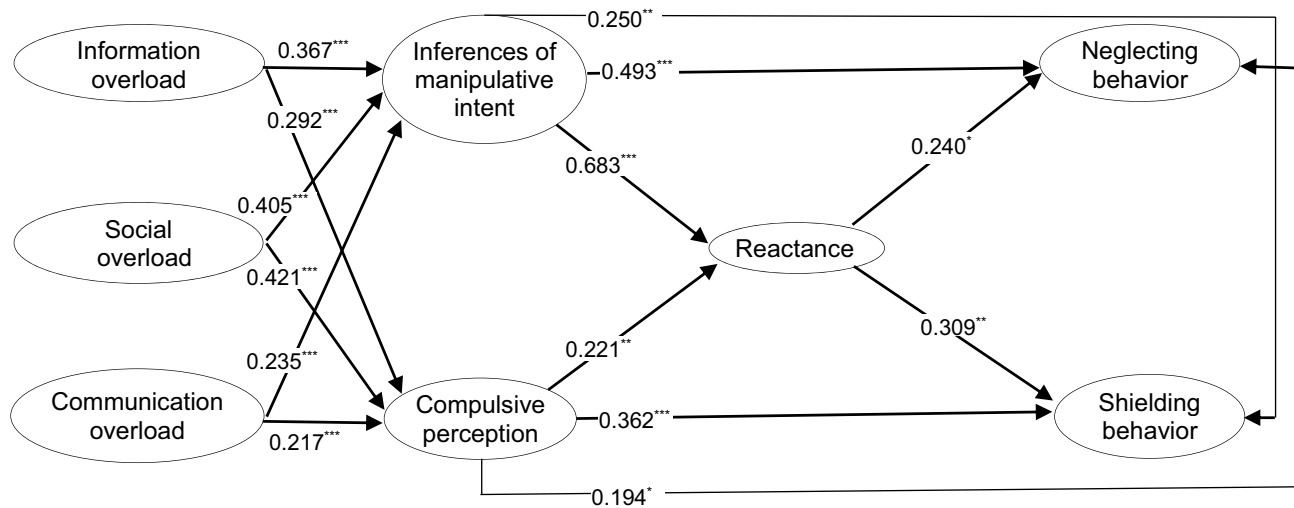
Notes: The numbers on the diagonal row were the square root of Average Variance Extracted (AVE). Off diagonal values were the correlations between the constructs.
Abbreviations: IO, information overload; SO, social overload; CO, communication overload; IMI, inferences of manipulative intent; CP, compulsive perception; PR, reactance; GX, guanxi; NE, neglecting behavior; BL, blocking behavior.

Besides, the AVE values for every construct were over 0.5, and the square root of Average Variance Extracted (AVE) was greater than correlations with the constructs (Table 4), which indicated good discriminant validity of our measurement model.¹⁰⁵ The values of AVE were over 0.50, and the values of CR were greater than 0.70 in Table 3. Therefore, the measurement model (MM) showed sound reliability and validity in our study. All the VIFs were lower than the threshold of 3.3, which showed that multicollinearity did not exist in this study.¹⁰⁸

To sum up, the results of analyzing the measurement model showed good model-data fit, good reliability, and good convergent (discriminant) validity.

Common Method Bias

This study employed the two methods to examine the potential common method bias (CMB). First, we employed the methods proposed by Liang et al¹⁰⁹ and presented a common factor with all indicators of the constructs in the MM. The results indicated that the average substantively explained 58.9% of the overall variance of the indicators, whereas the method factor accounted for only 3.8% of the variance, suggesting that CMB did not exist in our study. Second, this study employed the method of comparing the results of confirmatory factor analysis (CFA) from Podsakoff et al¹¹⁰ to examine CMV. The single-factor model has a significantly larger χ^2 -value ($\Delta\chi^2 = 3802.254 - 1215.499 = 2586.755$; $\Delta df =$



a *p<0.05, **P<0.01, ***P<0.001, NS: Non-significant

Figure 3 Structural model result (*p<0.05, **P<0.01, ***P<0.001, NS: non-significant).

629-593 = 36; $\Delta\chi^2 = 2586.755 > \chi^2 (\alpha = 0.05, df = 36) = 50.998$) than the multiple factor model, indicating that CMB was not a serious problem.

Structural Model

As shown in Figure 3, this study employed the structural model to examine hypothesized relationships and the model fitted the data very well ($\chi^2 = 493.880$; $df = 333$; $\chi^2/df = 1.483 < 3$; $GFI = 0.920$; $CFI = 0.977$; $IFI = 0.977$; $NFI = 0.932$; $RMSEA = 0.035$; $TLI = 0.974$; $SRMR = 0.030$). Regarding H1a-H1b, the results indicated that IO has positive effect on IMI ($\beta = 0.367$; $p < 0.05$) and CP ($\beta = 0.292$; $p < 0.05$), supporting H1a-1b (see Table 5).

For H2a-H2b, SO is positively associated with IMI ($\beta = 0.405$; $p < 0.05$) and CP ($\beta = 0.421$; $p < 0.05$), supporting H2a-2b (see Table 5). Consistent with H3a-H3b, the results indicated that CO positively impacts IMI ($\beta = 0.235$; $p < 0.05$) and CP ($\beta = 0.217$; $p < 0.05$), supporting H3a-3b (see Table 5 and Figure 3).

For H4a, IMI positively impacts on reactance ($\beta = 0.683$; $p < 0.05$), supporting H4a; for H4b, CP positively affects reactance ($\beta = 0.221$; $p < 0.05$), supporting H4b (see Table 5). In terms of H6a-H6b, IMI positively impacts on neglecting behavior ($\beta = 0.493$; $p < 0.05$) and blocking behavior ($\beta = 0.250$; $p < 0.05$), supporting H6a-6b (see Table 5). For H8a-8b,

Table 5 Hypothesis Test Results

Hypothesis	Path Relationship	Standardized Coefficient	Result
H1a	IO→IMI	0.367***	□
H1b	IO→CP	0.292***	□
H2a	SO→IMI	0.405***	□
H2b	SO→CP	0.421***	□
H3a	CO→IMI	0.235***	□
H3b	CO→CP	0.217**	□
H4a	IMI→PR	0.683***	□

(Continued)

Table 5 (Continued).

Hypothesis	Path Relationship	Standardized Coefficient	Result
H4b	CP→PR	0.221**	□
H6a	IMI→NE	0.493*	□
H6b	IMI→BL	0.250***	□
H8a	CP→NE	0.194**	□
H8b	CP→BL	0.362***	□
H10a	PR→NE	0.240*	□
H10b	PR→BL	0.309**	□

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, □: the hypothesis was supported.

Abbreviations: IO, information overload; SO, social overload; CO, communication overload; IMI, inferences of manipulative intent; CP, compulsive perception; PR, reactance; NE, neglecting behavior; BL, blocking behavior; NS, non-significant.

CP positively influences on neglecting behavior ($\beta = 0.194$; $p < 0.05$) and blocking behavior ($\beta = 0.362$; $p < 0.05$), supporting H8a-8b (see Table 5). For H10a-H10b, reactance positively impacts on neglecting behavior ($\beta = 0.240$; $p < 0.05$) or blocking behavior ($\beta = 0.309$; $p < 0.05$), supporting H10a-10b (see Table 5).

Mediation Analysis

To test the mediating effects of IMI, CP and PR, we employed the Baron & Kenny¹¹¹ method and the bootstrapping (PLS) approach to examine these mediating effects. As shown in Table 6, the bootstrapping approach (PLS) and SmartPLS 3.2.8 software were also employed to examine the indirect effects in this study. The bootstrapping method was conducted on 5000 bootstrap samples with a 95% confidence interval. As shown in Table 6, the p-values of the indirect effects were significant. The results showed that IMI mediates the effect of IO (H5a: $\beta = 0.148$, $T = 5.694$, $p < 0.05$), SO (H5b: $\beta = 0.109$, $T = 4.242$, $p < 0.05$), and CO (H5c: $\beta = 0.123$, $T = 5.178$, $p < 0.05$) on reactance, and that CP

Table 6 Testing of the Mediating Effects (SmartPLS Bootstrapping Approach)

Hypothesis	Mediation Path	Effect	T-values	P-values	Results
H5a	IO → IMI → PR	0.148	5.694	0.000	□
H5b	SO → IMI → PR	0.109	4.242	0.000	□
H5c	CO → IMI → PR	0.123	5.178	0.000	□
H5d	IO → CP → PR	0.110	4.858	0.000	□
H5e	SO → CP → PR	0.112	4.762	0.000	□
H5f	CO → CP → PR	0.096	4.812	0.000	□
H7a	IO → IMI → NE	0.122	5.294	0.000	□
H7b	IO → IMI → BL	0.064	2.893	0.004	□
H7c	SO → IMI → NE	0.090	4.083	0.000	□
H7d	SO → IMI → BL	0.047	2.655	0.008	□
H7e	CO → IMI → NE	0.101	4.646	0.000	□
H7f	CO → IMI → BL	0.053	3.089	0.002	□

(Continued)

Table 6 (Continued).

Hypothesis	Mediation Path	Effect	T-values	P-values	Results
H9a	IO → CP → NE	0.071	4.200	0.000	□
H9b	IO → CP → BL	0.103	4.620	0.000	□
H9c	SO → CP → NE	0.072	3.988	0.000	□
H9d	SO → CP → BL	0.104	4.454	0.000	□
H9e	CO → CP → NE	0.062	3.854	0.000	□
H9f	CO → CP → BL	0.090	4.814	0.000	□
H11a	IMI → PR → NE	0.127	5.564	0.000	□
H11b	IMI → PR → BL	0.140	5.387	0.000	□
H11c	CP → PR → NE	0.107	4.657	0.000	□
H11d	CP → PR → BL	0.118	5.035	0.000	□

Note: □, the hypothesis was supported.

Abbreviations: IO, information overload; SO, social overload; CO, communication overload; IMI, inferences of manipulative intent; CP, compulsive perception; PR, reactance; NE, neglecting behavior; BL, blocking behavior.

mediates the effect of IO (H5d: $\beta = 0.110$, $T = 4.858$, $p < 0.05$), SO (H5e: $\beta = 0.112$, $T = 4.762$, $p < 0.05$), and CO (H5f: $\beta = 0.096$, $T = 4.812$, $p < 0.05$) on reactance, supporting H5a-f.

As summarized in Table 6, IMI mediates the effects of SCOs (ie, IO, SO, and CO) on user disengagement (neglecting behavior, blocking behavior) respectively, which provided support for H7a-f. First, the results showed that IMI mediates the effect of IO on neglecting behavior (H7a: $\beta = 0.122$, $T = 5.294$, $p < 0.05$) and blocking behavior (H7b: $\beta = 0.064$, $T = 2.893$, $p < 0.05$). Second, IMI mediates the effect of SO on neglecting behavior (H7c: $\beta = 0.090$, $T = 4.083$, $p < 0.05$) and blocking behavior (H7d: $\beta = 0.047$, $T = 2.655$, $p < 0.05$). Third, IMI mediates the effect of CO on neglecting behavior (H7e: $\beta = 0.101$, $T = 4.646$, $p < 0.05$) or blocking behavior (H7f: $\beta = 0.053$, $T = 3.089$, $p < 0.05$).

As shown in Table 6, the results also demonstrated that CP mediates the effects of SCOs (IO, SO, CO) on user disengagement (neglecting behavior, blocking behavior) respectively, which provided support for H9a-f. First, the results showed that CP mediates the effect of IO on neglecting behavior (H9a: $\beta = 0.071$, $T = 4.200$, $p < 0.05$) and blocking behavior (H9b: $\beta = 0.103$, $T = 4.620$, $p < 0.05$). Second, CP mediates the effect of SO on neglecting behavior (H9c: $\beta = 0.072$, $T = 3.988$, $p < 0.05$) and blocking behavior (H9d: $\beta = 0.104$, $T = 4.454$, $p < 0.05$). Third, CP mediates the effect of CO on neglecting behavior (H9e: $\beta = 0.062$, $T = 3.854$, $p < 0.05$) and blocking behavior (H9f: $\beta = 0.090$, $T = 4.814$, $p < 0.05$).

The results also demonstrated that reactance mediates the effect of PTF (IMI, CP) on user disengagement (neglecting behavior, blocking behavior), respectively, supporting H11a-d.

Testing the Moderating Effects of Guanxi

To examine the buffer effects of guanxi, the dependent variable (user disengagement: neglecting behavior, blocking behavior) was regressed on the independent variables (IMI) and the moderating variable (guanxi) respectively. As shown in Table 7, guanxi negatively moderates the effect of IMI on NE ($\beta = -0.043$, $p < 0.05$), where the effect of IMI on NE is greater for the users with low guanxi compared with those with high guanxi, supporting H12a. For H12b, guanxi negatively moderates the effect of IMI on BL ($\beta = -0.056$, $p < 0.05$) in Table 7, where the effect of IMI on BL is greater for the users with low guanxi compared with those with high guanxi, supporting H12b. For H12c, guanxi does not moderate the effect of CP on NE ($\beta = -0.012$, $p > 0.05$) in Table 7, where the effect of CP on NE is not greater for the users with low guanxi compared with those with high guanxi, not supporting H12c. For H12d, guanxi negatively

Table 7 Interaction Moderation Analysis

Hypotheses	Std. β	T-value	Bootstrap 5000 Times, Bias-Corrected, 95% CI	Effect	Results
H12a: IMI \times GX \rightarrow NE	-0.043*	-2.208	[-0.0047, -0.0815]	Negative effect	Supported
H12b: IMI \times GX \rightarrow BL	-0.056**	-2.620	[-0.0139, -0.0973]	Negative effect	Supported
H12c: CP \times GX \rightarrow NE	-0.012 ^{ns}	-0.536	[0.0314, -0.0550]	-	Unsupported
H12d: CP \times GX \rightarrow BL	-0.048*	-2.216	[-0.0054, -0.0912]	Negative effect	Supported

Notes: * $p < 0.05$, ** $p < 0.01$, Std. β , standardized regression coefficient; Negative effect, a significant negative relationship.

Abbreviations: IMI, inferences of manipulative intent; CP, compulsive perception; NE, neglecting behavior; BL, blocking behavior; GX, guanxi; ns, not significant.

moderates the effect of CP on BL ($\beta = -0.048$, $p < 0.05$) in Table 7, where the effect of CP on BL is greater for the users with low guanxi compared with those with high guanxi, supporting H12d.

Discussion

Drawing the SOR framework and psychological reactance theory, this study investigated how SCOs influence user disengagement (ie, NE and BL), and how guanxi moderates the effect of PTF (ie, IMI and CP) on user disengagement (ie, NE and BL).

The results of analyzing the measurement model showed good model-data fit, good reliability, and good convergent (discriminant) validity. This study found that the values of the Cronbach's α exceed 0.7, indicating high internal consistency. We conducted a CFA to measure reliability and validity and found that (1) the CRs of all the constructs exceeded 0.7, indicating good reliability, and that (2) the square root of AVE was greater than correlations with the constructs, indicating good discriminant validity; All the VIFs were lower than the threshold of 3.3, showing that multicollinearity did not exist in this study, being in line with approaches of Pang & Ruan,⁴ Pang & Ruan;¹⁵ the results of examining the structural model also showed the model fitted the data very well. In sum, the validity and accuracy of the data were verified.

The findings are concluded from the empirical study. First, we identified that SCOs consist of IO, SO, and CO in SC, extending recent works that overload includes IO and CO.^{4,15} Second, SCOs (ie, IO, SO, and CO) positively affect IMI, which extended the findings of Lunardo et al¹¹² that disfluency can enhance IMI. One possible explanation is that as WeChat sellers offer excessive ad information and social requests to users (namely disfluency), which will initiate their persuasive knowledge structure, cause their skepticism toward the motivation of WeChat sellers posting information behaviors, and then induce the IMI of users.⁴¹ Third, SCOs (ie, IO, SO and CO) have positive effects on CP, being in line with the finding of Wang & Cheng³⁵ that information influence and social normative influence positively impact forced exposure. This is because SCOs make users feel compelled to process the vast information that exceeds their processing capacity. Second, IMI positively impacts psychological reactance, extending the finding of Youn & Kim² that PTF has positive influences on anger, one dimension of psychological reactance. In SC context, users are exposed to excessive ads and social requests exceeding their processing capacity, which can initiate their persuasive knowledge structure, cause their skepticism toward the motivation of social interactions or requests initiated by SC sellers, and will elicit their reactance against sellers' manipulation. Fourth, CP positively impacts reactance, extending the findings of Youn & Kim² that PTF positively impacts reactance. Fourth, IMI and CP have positive influences on neglecting behavior and blocking behavior, extending the works from Wang & Cheng³⁵ that IMI and CP may reduce consumers' acceptance intention to proactive recommendation services. Fifth, reactance positively impacts neglecting behavior and blocking behavior, extending the findings of Ham⁹⁶ and Youn & Kim.² One possible explanation is that to regain or restore the freedom, individuals may engage in resisting the persuasive messages or behaving oppose to the intention of the messages.^{84,92} When being exposed to excessive ad messages, users engage in resistance or persuasive boomerang including ad avoidance.^{93,96} Ham⁹⁶ found that psychological reactance caused consumers to disengage online ads, such as ad avoidance. Sixth, guanxi negatively moderates the effects of IMI on neglecting behavior and blocking behavior, and guanxi also negatively moderates the effect of CP on BL rather than NE. In line with the previous findings that

individuals with high guanxi value reciprocity tend to capture relationship harmony, including conflict avoidance,⁵³ but those with low guanxi do not. In SC context, when encountering excessive ads or messages, users will inference that friends engaging in WeChat business are attempting to persuade them with the inappropriate and manipulative means, such as ads, messages and posts, and feel forced to purchase products. When exposed to excessive ads, messages, or social requests, both high-guanxi users and low-guanxi users will neglect them; in this event, high-guanxi users have to provide social support for SC sellers to establish and maintain harmony relationship with them (including reading ads and liking) and do favors for friends (eg, reposting their ads and purchasing products from these sellers), but low-guanxi users will block excessive ads or reject to conduct social interaction.

Theoretical Implications

Our study offered five interesting insights. First, distinct from most studies focusing on the positive side of social commerce,²⁶ we focused on its dark side, which has attracted little attention.¹¹ This study employed the S-O-R framework to analyze a novel phenomenon (user disengagement elicited by SCOs) by demonstrating the different effects of three dimensions of SCO (IO, SO, and CO) on user disengagement. We identified the antecedents of organism experience (ie, IMI, CP and PR) and employed responses to show behavioral response strategies (neglecting behavior, blocking behavior) to the stimuli. Since little attention has been paid to user disengagement elicited by SCOs, this study fully complemented the existing literature and contributed to better understanding of the dark side of social commerce by unpacking the influencing mechanism of SCOs on user disengagement.^{4,15}

Second, we uncovered the important antecedents of psychological reactance in the SC context from the subjective perspective and conceptualized it as an aversive psychological state. Previous works focused on perceived autonomy or intrusiveness,⁴² and regarded PTF as a single construct,² while paying little attention to the effect of sub-dimensions of PTF (ie, IMI and CP) on reactance. This study measured PTF with two subdimensions (ie, IMI, CP)^{7,35} to address the gap and demonstrated that IMI and CP have a pivotal role in inducing reactance. Based on previous studies that examined the relationship between PTF and reactance,² this study provided new implications by directly measuring IMI and CP. We further found that IMI and CP positively affect reactance, extending the findings of Edwards et al⁴², Mou & Ji⁷ and Youn & Kim.²

Third, drawing upon PRT, we revealed the impact mechanism of SCOs on reactance. The mediation analysis provided evidences for the results with partial mediation of IMI and CP, which extended the findings of Mou & Ji.⁷ The findings enriched the existing studies of SCOs and psychological reactance in the mobile SC context.

Fourth, our study contributed to the user disengagement research by demonstrating the mediating effect of reactance in partially impacting the relationship between its antecedents (IMI and CP) and user disengagement. This study explored the interrelationship among the antecedents, reactance and user disengagement, which advanced our understanding of why users are active to deal with excessive ad information. We also measured PTF with IMI and CP and investigated how each sub-construct has different correlations with antecedents and behavioral responses to reactance.^{2,113} Then, user disengagement was made a distinction between neglecting behavior and blocking behavior,^{114,115} being in line with the results of Yan et al⁷⁴ that avoiding ads positively impacts on news consumption of users. This study captured a neglect-block continuum of user disengagement depending on the intensity of SCOs. When forced exposure to posted information including messages and ads, users might not pay attention to, skip over or even neglect the information. What's more, users may click "Don't look at him", employ the option to block the excessive messages or ads in WeChat moments from friends engaging in WeChat business, and click the option, "Message free", to unfollow them, which will also generate revenue for sellers.

This makes it possible to examine the distinct effects of the two sub-dimensions of perceived threats to freedom (PTF) on user disengagement. For instance, IMI in PTF is more likely to impact NE rather than BL. When SC users regard posted ad information from friends as manipulative or intention to control themselves, they may overlook or gloss over excessive messages and ads from friends or less contacts with SC sellers with minimal cost. That is, as users' manipulative intent conception triggered by SC sellers is activated, they would get away from the excessive messages and ads to restore their freedom.² However, CP in PTF may give more influence to BL rather than NE, which indicated

that CP of forced exposure forces users to take actions to restore their freedom,^{7,84} being in line with the findings of Mou & Ji.⁷

Fifth, we employed Chinese guanxi in our research model as a social capital from the interpersonal relationship perspective, and uncovered its moderating effect on user disengagement on mobile social platform, which extended the study of Shao & Pan.¹⁰² Existing literature has indicated that the importance of guanxi in the organizational behavior context,^{51,58,116–119} but little is known that, as a typical factor of Chinese culture, how guanxi affects user disengagement. This study combined the social exchange theory and social capital theory to examine the effects of guanxi on user disengagement in mobile social media and demonstrated the negative moderating effect of guanxi. These findings extended the studies of guanxi by verifying the cushioning effects of guanxi and the importance of construction and maintenance of guanxi in China in SC context.¹⁰²

Practical Implications

This study can offer some fresh practical suggestions to SC sellers, users, service providers, and managers (developers).

First, this study found that SCOs involve three different dimensions, namely IO, SO, and CO, so SC sellers need to understand how IO, SO, and CO elicit user disengagement in SC context. For instance, sellers can reduce user disengagement by providing essential and personalized ad information and appropriate social interaction for users in SC. In addition, SC managers can take measurements to decline user disengagement, including limiting the number of social ads at WeChat Moments posted by sellers per day.

Second, the results show that SCOs may cause IMI, CP, and reactance of users, and then result in user disengagement. Thus, social media developers can conduct diverse strategies to improve system functionality to reduce IO, and SC sellers could offer user psychological relief to users for possible SO and CO in the actual operation.⁴ For example, developers of SC can provide filtering approaches and techniques (eg, empowering users to restrict the amount of information and the diversity of communication needs and contacts) to decline IMI, CP, and reactance of users. In the case, users can take some actions to avert exposure to excessive ad-related messages or posts from SC sellers. By employing the strategies (eg, clicking the button “Message free” to ignore excessive ads or social requests, clicking “Don’t look at him” to block the ads at WeChat moments, and even placing them on a blacklist), users can economize their time and energy into processing excessive SC messages, or give deferred and centralized responses. Besides, users can log out transiently from social media apps (eg, WeChat) to neglect excessive SC information or interactions for the time being in the workplaces or other vital occasions.

Third, we provide some guidelines for sellers engaging in SC marketing. 1) SC sellers are able to build guanxi with users to reduce user disengagement by providing personalized, delicately and brief branded contents for users. 2) SC sellers can work out which business messages or ads are blocked, unfollowed, or hid and improve their strategies of posting business information, which facilitates them to offer valuable and diagnostic information for users to lay down precision marketing plans and deliver personalized information (eg, messages or ads) to the target users. 3) SC sellers can exploit persuasive and effective strategies to lower users’ IMI and CP, and manipulative intent-reducing strategy and compulsive-reducing strategy should be established to decrease reactance. To begin with, as a manipulative intent-reducing strategy, SC sellers can encourage users to share real usage experience of products with their high-guanxi friends, which facilitates users to obtain useful knowledge, and attracts users to follow suitable products in need from his or her own initiative. In addition, as a means to decline compulsive conception of excessive information, SC sellers need to analyze the demand of the target users and post directionally personalized relevance or valuable business information (eg, messages or ads) in need to high-guanxi users instead of posting information directly and roughly to promote products to everyone.¹²⁰

Fourth, our study can provide insights for SC service providers or operators. SC service providers can offer more options to control users’ exposure to excessive business information. SC service providers can provide more filter options for users to decrease external interference from forced exposure to ads from SC sellers in WeChat moments,² and limit SC sellers to post excessive information, which may decline users’ psychological reactance. SC service providers can conduct advertising regulation by offering formal advertising format and limiting the number of words and pictures to reduce SCOs of users. Moreover, WeChat operator can provide more options for creators or administrators of friend

groups to restrict the number of ads released by WeChat sellers, and even let them shut up in friend groups for the time being, which will be conducive to reduce SO and CO. In sum up, these tactics will be instrumental in reducing user disengagement and optimizing the development of social media marketing industry.

Limitations and Future Research

This study has several limitations. First, to explore the differential effect of SCOs on user disengagement in oriental culture based on guanxi, we conducted the survey on WeChat in China, which may decrease the external validity of the findings. Future research can employ broader SC participants from different countries and further examine the existence of cultural differences.

Second, this study focused on IMI and CP as main drivers of user reactance and disengagement behaviors, and future studies can explore more antecedents and consequences of user negative engagement. When facing up with SCOs, user's behavioral responses not only include user disengagement but also user negative engagement behaviors, such as complaining to social media platforms (eg, WeChat) for their excessive posting ads behaviors.

Third, future research can explore the moderating effects of each sub-dimension of guanxi in Chinese society, such as *Ganqing*, *Renqing* and *Xinren* and examine the boundaries of the model. The moderating analysis of the three sub-dimensions will offer more interesting findings.

Fourth, as disruptive technologies (eg, artificial intelligence generated content (AIGC) technologies) now appear in SC context, SC sellers can employ AIGC technologies to offer more personalized contents (eg, ads, or social requests) at much lower cost, which may lead to more overloads for users. Therefore, future studies could pay more attention to the underlying psychological mechanisms of the overuse of AIGC on user disengagement, and investigate the double-edged sword effect of AIGC in SC context.

Finally, we employ a survey to collect data, and future studies could adopt more methods (eg, machine learning) to obtain panel data or unstructured big data (eg, image data, text data, blood pressure data) in different periods and examine the theoretical model.

Conclusion

Social commerce overloads (ie, information overload (IO), social overload (SO), and communication overload (CO)) positively impact reactance via inferences of manipulative intent (IMI) and compulsive perception (CP); IMI and CP positively influence reactance; IMI, CP, and reactance positively affect user disengagement (ie, neglecting behavior and blocking behavior); guanxi has the buffer effect on the relationship between IMI (CP) and user disengagement, negatively moderates the impacts of IMI on user disengagement (ie, neglecting behavior and blocking behavior), and negatively moderates the effects of CP on blocking behavior but not neglecting behavior. The findings of this study contribute to the literature on PRT and user disengagement by displaying the effects of excessive social commerce activities on user disengagement and uncovering the buffer effect of guanxi, which can help social e-commerce practitioners better reduce the negative effect of social commerce overloads.

Ethics Approval and Informed Consent

This study involving human participants has been approved by the ethics committee at Sichuan University, China. Informed consent was obtained from all individual participants in this study. Participants were assured of confidentiality and anonymity of the information relating to the survey. This study was conducted according to the guidelines of the Declaration of Helsinki.

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Author Contributions

All the authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas. All the authors took part in drafting, revising or critically reviewing the article. All the authors gave final approval of the version to be published. All the authors have agreed on the journal to which the article has been submitted. All the authors agree to be accountable for all contents of the work.

Disclosure

The authors report no conflicts of interest in this work.

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