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How Does Perceived Social Presence Drive Impulse Buying Online? The Mediating Role of Flow Experience and Consumer Trust

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ABSTRACT

The emergence of socially interactive shopping platforms in the era of online shopping has given a boost to online impulse purchases. However, little research has been conducted on the psychological processes underlying this phenomenon. This study investigates how perceived social presence (SP) (stimulus) influences impulse buying behaviour (IB) (response) through two mediators: flow experience (FE) and consumer trust (CT) (organism), guided by the stimulus–organism-response (S-O-R) model. In addition, the study examines how two important situational factors—time and availability of money—modify the relationship between FE and IB. A structured online survey collected information from 565 Indian online shoppers. The results show that perceived SP significantly increases customer trust and the FE, positively impacting IB. Statistical evidence for the mediating roles of FE and CT was significant. This study's proposed dual-path mediation model can contribute to the growing literature on e-commerce impulse purchasing. Practical recommendations are made for online companies to optimize consumers' engagement, build trust, and strategically induce impulse purchasing.

Keywords: Impulse Buying Behavior, S-O-R Model, Perceived Social Presence, Flow Experience, Consumer Trust, Online Shopping
JEL Classifications: M31, D12, D91, L81

1. INTRODUCTION

Online shopping has changed how people view, evaluate, and buy goods over the last 10 years. It has evolved from a convenient choice to a critical component of international retail. The advent of digital technologies and mobile commerce has given consumers instant access to a variety of goods and services, sometimes without the need to visit a store (Xia et al., 2024). The change in retail formats significantly impacts consumer buying behavior, particularly by facilitating spontaneous, unplanned purchases. Impulse purchases—a brief, strong desire to buy something without conscious thought—are increasingly a phenomenon of online shopping (Wang et al., 2022; Huang et al., 2024). Compared to the physical, brick-and-mortar environment, the online environment facilitates such behavior through personalized suggestions, time-sensitive promotions, and algorithmic promotions (Ampadu et al., 2022). The move to online shopping facilitates greater access to products and brings forward psychological cues that influence consumers to make fast and emotion-driven decisions (Niza Braga and Jacinto, 2022; Al Hamli and Sobaih, 2023). Therefore, understanding what drives impulse buying in an online context has become a fundamental area of research for academics and practitioners alike.

Among the many factors that influence online buying behavior, perceived SP is an important psychological and experiential factor. SP is the extent to which a medium allows users to perceive others as being present as psychological beings in an interaction (Short e al., 1976). In online shopping, it is the perception that there are human beings behind the interface that infuses human warmth as well as feelings of connectedness in buying experiences (Gefen and Straub, 2004). With improved online interfaces, websites are more likely to include interactive and immersive elements such as live support chat, customer reviews,

live video demonstrations, avatars, and live-stream shopping events (Saffanah et al., 2023; Joo and Yang, 2023). These elements replicate the social interactions normally experienced in physical stores and lead to user engagement and emotional connection. By creating a perception of interpersonal connection, perceived SP will more than likely overcome perceived risk, create trust, and elicit emotional responses that can lead to unconsidered, impulse purchases (Lim et al., 2024). As digital platforms increasingly blur the line between social interaction and commerce, the role of SP in regulating consumer choices deserves greater scholarly attention.

Both SP and impulse buying have been studied extensively in the consumer behavior literature, but most research on these factors is usually conducted separately. Previous studies on impulse buying have focused on platform design, environmental factors (such as product placement and promotions), and individual differences (such as mood and impulsivity) (Le et al., 2025; Huang et al., 2024; Yang et al., 2022). SP, or its effects on user engagement, trust formation, or purchase intention, has been the subject of relatively more research (Huang et al., 2023; Chen et al., 2023). There is, however, relatively little work that integrates these two lines of research to shed light on the mechanisms through which SP generates IB, particularly online. Although recent research suggests that human-like online features or real-time interactions can elicit emotional and psychological responses, we still do not fully understand how these processes work, nor do we have sufficient data to substantiate them. There is relatively little research on how SP affects consumers' psychological states, e.g. immersion, emotional arousal or trust, which in turn trigger unplanned and impulsive purchases. This is a conceptual gap that researchers need to address, especially at a time when digital platforms are increasingly filled with social content.

In order to gain a better understanding of the impulse buying relationship with SP, it is of utmost importance to examine the psychological processes that can serve as intermediaries in the relationship. The FE, a state of intense engagement, enjoyment and concentration in which customers are completely absorbed in the current activity, is one of the facilitators (Csikszentmihalyi and Csikzentmihaly, 1990). By creating rich and fluid experiences, flow in online shopping has been found to increase customer satisfaction and reduce purchase resistance (Mitev et al., 2024; Ruangkanjanases et al., 2024). Social richness in the form of real-time communication or avatars with human-like characteristics can make the FE rich for customers and push them towards impulse purchases. The second mediator is CT, which is especially significant in the e-commerce context because of the risk and uncertainty of online transactions (Kim et al., 2008). Perceived SP can motivate trust by diminishing psychological distance, raising the perceived credibility of the seller, and raising transparency (Attar et al., 2023). Customers are more likely to make impulsive purchases without giving them much thought if they have a higher level of trust. Collectively, these intermediaries—CT and purchase FE—establish a two-way model that illustrates how SP leads to impulse buying. It is possible that SP not only engages consumers in the shopping environment but also provides comfort, thus setting affective and cognitive channels toward spontaneous purchases. However, these mediators have rarely been examined under a single model, thus creating an underlying gap that this study aims to fill.

This study aims to explore the mechanism of consumers' IB in online shopping situations by particularly looking at the role of perceived SP. Although previous research has examined various antecedents of impulse buying, this study extends the S-O-R model to provide a more comprehensive explanation. In this model, SP is defined as the stimulus that elicits the consumer's response, while the consumer's FE and confidence are identified as important mediators at the organismic level, reflecting the consumer's internal psychological and affective state. Finally, IB is considered the behavioral outcome following these inner processes.

This study adds significantly to the corpus of research on IB and online consumer behavior. Theoretically, this research provides a combined model linking SP perception to IB via dual mediating processes of FE and CT. The dual-path model bridges a large body of literature by explaining how emotional (FB) and cognitive (CT) responses jointly mediate social stimuli-consumer action relationships. This integrative approach makes the current research different from existing research that has conventionally controlled for these variables. From the managerial point of view, the findings are useful to UX/UI designers, e-commerce marketers, and platform developers who want to encourage consumer interaction and impulse buying. By showing how SP affects psychological immersion and trust, the study provides a strategic basis for designing interactive features such as live chats, virtual influencers, and real-time ratings that simulate social interaction.

2. THEORETICAL BACKGROUND AND HYPOTHESES

The present study uses the S-O-R model serves as a theoretical foundation for understanding the process by which perceived SP influences IB. The S-O-R model was originally developed by Mehrabian and Russell (1974) and assumes that stimulus from the environment (S) lead to internal organism or cognitive states (O), which in turn lead to behavioral responses (R) (Chang et al., 2011). This model's ability to incorporate numerous psychological and environmental factors makes it perfect for online buying scenarios (Chan et al., 2017; Gao et al., 2022; Lou et al., 2022). This is consistent with the two-path model of this study, in which SP (S) triggers FEs and trust (O), which in turn lead to IB (R). Furthermore, the model allows for the testing of mediating mechanisms and is thus perfectly suited to test how internal psychological states respond to social stimuli in the form of behavioral responses.

2.1. Perceived Social Presence and Impulse Buying

SP has been universally termed in initial communication theory as "the extent to which a medium allows users to experience others as being psychologically present" (Fulk et al., 1987). According to Short et al. (1976), SP refers to a quality inherent in a communication medium that indicates its ability to transmit human-like cues, such as tone, posture, and facial expressions, which contribute to making communication feel warm and human.

This has become important in e-commerce and marketing. As Hassanein and Head (2007) elaborate, online shopping situations are usually perceived as mechanized, impersonal, and anonymous, as opposed to the strongly social nature of offline business. It has been shown that online consumer engagement is limited by the lack of a human element (Sidlauskiene et al., 2023; Rohit et al., 2024). To counteract this, sites are more and more adding design elements that foster SP—either in actual interaction (e.g., live chat, customer support) or in simulated interaction (e.g., socially animated images, emotional text, avatars) (Nguyen and Pham, 2024).

Perceived SP fosters warmth, sociability, and co-presence. For example, capabilities like chat, personalized welcome messages, speaking-face avatars, and emotive text or images allow individuals to imagine human interaction, hence making the environment more psychologically interactive (Merrill et al., 2022; Bai et al., 2024; Kroczek et al., 2024). These cues are important as they increase perceived trust, enjoyment, and helpfulness of the website, all of which have a direct impact on consumer attitudes and purchase intentions (Huang et al., 2023). Kreijns et al. (2024) and Ghali et al. (2024) point out that SP can be a significant psychological experience that can enhance user enjoyment and engagement. Tan and Liew (2022) found in their empirical study that even subtle interface manipulations, such as human-like images and tailored explanations, significantly boosted users' perception of SP, which further promoted trust and positive attitudes toward the e-commerce website.

Empirical studies in e-commerce and live streaming contexts regularly show that a high perceived SP can reduce cognitive control and activate spontaneous consumer behavior. For instance, Li et al. (2022) found that SP of broadcasters and live streamers has a significant influence on IB via pleasure and arousal over rational consideration. Similarly, Feng et al. (2024) show that affective and cognitive reactions— triggered by social cues and interactivity trigger a stronger impulse to buy. Liu et al. (2022) also confirm that interactive behavior (e.g., real-time product info and demos) increases SP, induces conformity, and reduces deliberation. Chen et al. (2023) then associate SP with stronger identification with the live streamer, which increases emotional congruence and purchase intention. Li and Hua (2022) argue that SP increases observational learning as well as affective trust, offering opportunities for impulse buying. Such observations point to the fact that the more socially engaged and involved consumers are in live-streaming environments, their cognitive barriers are reduced, making them more likely to make impulsive choices. On the basis of these findings, we propose:

H_1: Perceived SP has a significant positive effect on IB.

2.2. Perceived Social Presence and Flow Experience

Flow, which was first introduced by Csikszentmihalyi (2000), is a peak psychological condition where a person is fully engaged in and satisfied with a task. Flow is characterized by the integration of action and consciousness, the disappearance of self-consciousness and the distortion of the sense of time (Csikszentmihalyi and Csikzentmihaly, 1990; Nakamura and Csikszentmihalyi, 2002). Abuhamdeh (2020) validated this view by showing that flow is a discrete, highly enjoyable state of consciousness different from being engaged in work.

Highly social contexts, such as live-streaming communities, create optimal flow conditions through the facilitation of sustained user attention and emotional engagement. These contexts facilitate immediate interaction, emotional feedback, and social signals, which serve to enhance users' attentional investment—a strong predictor of flow (Lv et al., 2022). This immersion facilitates the integration of action and consciousness and minimizes distractions and allows one to be unaware of time (Lin and Lee, 2024; Yuan and Lee, 2023). In particular, flow is increased when the perceived skills and perceived challenge are high and when the task allows for a high degree of feedback and social interaction (Chung and Pan, 2023; Prajod et al., 2024). Thus, the humanity and interactivity of live streaming platforms can significantly improve concentration and enable entry into a state of flow.

User engagement on short video platforms and social commerce apps is immensely high in highly socially interactive environments, as a number of empirical studies show. Yang et al. (2023) found that at the core of consumer engagement are interactive behaviors such as commenting, sharing, and replying to posts where users receive value and affirmation that are community-focused. Using big data from Instagram, Xiao et al. (2023) also found that entertainment and engagement strength—i.e. the degree of closeness between users and influencers—are factors that contribute to engagement, and that strength increases with the type of product. Yang and Lee (2022) demonstrated how the interactive and relationship-quality content on Douyin indirectly activates and fosters customer loyalty, underscoring the significance of sustained social interaction in mobile short-form video shopping (MSFV). Zheng et al. (2022) also noted that while all forms of engagement do not have a similar impact on purchase behavior, high social interaction (e.g., active comments) can positively help in the acquisition of customers, prompting e-tailers to focus on strategic engagement strategies in live-streaming. Yin et al. (2024) demonstrated that under short-form video apps, the transition from purchase intention to purchase behavior is context-specific and brand familiarity-mediated—suggesting socially embedded ads within interactive environments serve a particular purpose beyond mere e-commerce. Collectively, these studies reiterate that richly social interactive features on SFV and livestreaming websites are critical in instilling user engagement and influencing consumer behavior. When customers are aware of the presence of others—with immediate conversations, emotive feedback, or interactive hosts—there are more chances that they will feel SP and psychological involvement (Lv et al., 2022; Flavián et al., 2024). Such heightened SP diminishes self-awareness and improves attentional engagement, thereby improving immersion (Della Longa et al., 2022). With immersion becoming more intense, users will be more likely to be in the flow state, where single-minded concentration exists with enjoyment and unawareness of time (Fang and Chung, 2025). Thus, socially enriched interfaces not only simulate interpersonal interaction, but also evoke the optimal psychological states for the flow state. Based on these findings, we propose:

H_2: Perceived SP has a significant positive effect on FE.

2.3. Flow Experience and Impulse Buying

Flow, in the sense discussed by Csikszentmihalyi (1990), is a state of increased involvement in an activity with complete focus,

satisfaction, and distorted perceptions of time. In the context of online business, this mental state increases emotional involvement, suppresses logical cognitive regulation, and consequently makes consumers more prone to impulse buying. Flow switches affective and cognitive experience in online consumer behavior, with affective drivers such as pleasure, arousal, and telepresence as the forces motivating user behavior (Shahpasandi et al., 2020; Husada et al., 2024). Affective drivers overcome deliberate thinking, and decision-making shifts towards instant pleasure and immediacy. Validations from marketing research confirm that highly immersive environments such as live streams and social media apps promote impulsivity by creating flow states. Huo et al. (2023) found that factors such as interactivity, SP, and time-limited promotions during live shopping significantly increase users' FEs. This heightened state leads users to act more emotionally and spontaneously, triggering unplanned purchases in most situations. Shahpasandi et al. (2020) have also shown that Instagram users who are in a flow state, which is enhanced by hedonistic browsing and interactivity on the site, show increased emotional engagement and a tendency to impulse buy. FE interferes with self-regulation processes, a crucial determinant of impulse control. As participants become very absorbed, pleasure in the task decreases self-monitoring capability and consequence evaluation (Novak et al., Hoffman, and Yung, 2000). Such impaired cognitive resistance to temptation induces gratification immediately, a major element of IB. Emotional arousal replaces rational thinking, and customers buy spontaneously without planning or worrying about the long-term effects (Huo et al., 2023; Shahpasandi et al., 2020). Based on these findings, we propose:

H_3: FE has a significant positive effect on IB.

2.4. Mediating Role of Flow Experience

Recent empirical research on digital commerce points to a sequential and psychologically important relationship: (1) Perceived SP leads to an enhanced FE and (2) The FE increases IB. SP— achieved through live chats, avatars and real-time communication—stimulates attention and emotional engagement, two requirements for entering a flow state, according to Lv et al. (2022) and Lin and Lee (2024). Under these conditions, people experience pleasure and immersion and are less self-aware and more action-oriented and have less rational control of behavior (Fang and Chung, 2025; Flavián et al., 2024). Flow serves as a psychological link between impulse purchase and SP by transforming interpersonal cues into deep attentional and emotional immersion. When customers are immersed in a rich social interface, their behavior is affective and intuitive, replacing rational decisions. As Mitev et al. (2024) and Ruangkanjanases et al. (2024) show, immersion can reduce cognitive resistance and increase pleasure, so that users respond to emotional impulses rather than intentional decisions. This flow-mediating function has been empirically verified in live streaming and short video shopping scenarios, where customers are more likely to become impulse buyers under high-flow conditions (Huang et al., 2023; Li et al., 2022). This study's model is reflective of this rationale, indicating that flow not just increases emotional arousal but also bypasses self-regulation, generating immediate satisfaction, a primary factor of impulse buying. Based on these findings, we propose:

H_4: FEmediates the connection between perceived SP and IB.

2.5. Perceived Social Presence and Consumer Trust

SP is an important factor in CT in online shopping, especially through interactive functionality like live chat, active communication, human avatars, and peer-like interactions. If the user perceives the system as socially present—warm, responsive, and human—they tend to trust the product and the merchant. For example, Tan and Liew (2022) found that an arrangement with one chatbot elicited higher SP and stronger trusting cognitions (trustworthiness, benevolence, and integrity) than an arrangement with multiple chatbots. Ongoing interaction with a consistent chatbot felt more human-like, and this even increased the perception of "realness" and authenticity of the website. According to source credibility theory, which states that users judge a person's competence and reliability based on social cues, trust was influenced by both the content and presentation of this information (Filieri et al., 2023). AI-based responsive agents that act in the user's best interest and reduce cognitive load can also promote trust (Pavone et al., 2023). This argument is supported by the theory of computers as social actors, which proposes that users apply human social norms in online interactions (Nass and Moon, 2000). It is for this reason that chatbots presented with human-like dialogue and avatar imagery more successfully elicited trust. In addition, SP was a partial mediator of user interface design and perceived trust in the platform, supporting its initial role in building trust. The perceived sociability and SP of a consistent representative reinforced trust in the seller's integrity and capabilities, important factors in online purchasing decisions. This is in keeping with prior research findings whereby anthropomorphic interfaces enhanced trust transference from the chatbot to the entire e-commerce site (Handoyo, 2024; Wu et al., 2023; Tan and Liew, 2022; Koh and Sundar, 2010). Based on these findings, we propose:

H_5: Perceived SP has a significant positive effect on CT.

2.6. Consumer Trust and Impulse Buying

Trust is significant in reducing perceived risk, especially when transactions are lacking face-to-face interaction and involving uncertainty (Kim et al., 2008; Gefen and Straub, 2004). Through trust in the seller, site, or company, consumers feel more confident and less unclear about product or payment issues (Ye et al., 2023; Wang et al., 2022; Xiao et al., 2018). This diminished perception of risk generates confidence in making decisions, enabling consumers to abandon careful thinking and respond more impulsively. Decreased risk has been shown to stimulate faster decision-making and induce impulse buying. According to trust transfer theory (Stewart, 2003), consumers are inclined to transfer their trust from a known source (e.g., a popular brand or social media) to a relatively unknown seller. This transfer reduces decision anxiety, making customers more susceptible to emotionally driven, impulsive purchases. Past research has shown that CT within social commerce sites is an asset for impulse buying (Xu et al., 2024; Chen et al., 2019), especially when channeled by familiar brands or social cues like likes and reviews. The experimental findings of this study confirm that increased trust is correlated with decreased perceived risk and increased impulse buying desire, especially when products are promoted by well-known brands or in extremely engaging posts (e.g., likes) (Yoon et al., 2024; Wang et al., 2021; Phua and Ahn, 2016). Thus, in models of impulse

buying, reduced risk facilitated by trust is the key facilitator, lowering psychological barriers and making customers more inclined to make impulse purchases.

H_6: CT has a significant positive effect on IB.

2.7. Mediating Role of Consumer Trust

There exists a significant body of literature supporting the sequential relationship between perceived SP and CT, which in turn invokes IB. Interactive features, like live chat, humanlike responding avatars, and personalized communications, help consumers to perceive digital platforms as socially responsive and rich (Tan and Liew, 2022). Such perceived humanity generates trusting cognitions—benevolence, trustworthiness and integrity—towards both the provider and the platform (Filieri et al., 2023). Based on the theory of source credibility and the paradigm of computers as social actors (Nass and Moon, 2000), such socially embedded cues can create trust even in AI systems. Trust also serves as a psychological mechanism that lowers perceived risk, thus making consumers confident and secure in their decisions (Kim et al., 2008; Ye et al., 2023). By lowering decision anxiety, consumers are more likely to be involved in emotionally intense, spontaneous buying. This effect is well explained by trust transfer theory (Stewart, 2003), according to which trust that is created by social cues is transferred from familiar ones (e.g., brands or sites) to particular sellers. Empirical data has consistently confirmed that trust plays the mediating role in theories of impulse buying in e-commerce, particularly when buyers are motivated by social signals such as reviews, likes, or interactive engagement (Chen et al., 2019; Xu et al., 2024; Yoon et al., 2024). Trust can therefore explain both the process and how SP leads to impulse buying. SP creates a sense of authenticity and relational intimacy, which enhances trust, and enhanced trust reduces cognitive defenses to enable faster, affectively charged purchase decisions. The mediation logic not only summarizes these measures but is also consistent with observed behavioral outcomes in the context of online shopping.

H_7: CT mediates the connection between perceived SP and IB.

2.8. Conceptual Model

In this manuscript, the S-O-R model is used to investigate the influence of the perception of SP on IB in the context of e-shopping. As shown in the conceptual model (Figure 1), perceived SP, characterized by interactive elements, acts as an external stimulus (S). The stimulus leads to internal psychological states or organisms (O), which are represented by two mediators: FE and CT. Flow is the affective state of immersion that increases pleasure and reduces cognitive control, while trust is the CT in the platform or seller that reduces perceived risk. These organismic states thus lead to impulse buying, the behavioral response (R) characterized by IB. The theory assumes that SP not only has a direct influence on IB (H_2-H_4), but also an indirect influence on IB through consumer FE and trust (H_5-H_7), representing a dual mediation process. The integrated framework shows how affective and cognitive pathways jointly explain how anthropomorphic, socially contextualized environments determine IB—extending previous S-O-R-based research in live-stream and e-commerce environments.

3. METHODOLOGY

3.1. Measurements and Questionnaire Design

The survey questionnaire for this research was originally designed in the English language and adapted to suit South India's cultural and linguistic context. For guaranteeing clarity, contextual suitability, and linguistic accuracy, the questionnaire was reviewed by three academic experts in marketing and behavioral research who understand the region. The final instrument included verified items from established research, and they were measured using a five-point Likert scale from 1 = "Strongly Disagree' to 5 = "Strongly Agree". Three items from Lee and Shin (2014), were used to measure perceived SP extended by Ming et al. (2021), with such statements as "I felt like I was interacting with a real person while shopping online." FE was assessed with four items from Hsu et al. (2017) and Liu et al. (2019), describing states of enjoyment and immersion. According to Kim et al. (2008) and Tan and Liew (2022), CT was measured with three revised items tapping perceived integrity and reliability. IB was assessed with three items taken from Beatty and Ferrell (1998) and Rook and Fisher (1995), including "I bought something online that I hadn't intended." Demographic data such as gender, age, educational level, and online purchase experience were also collected. To determine relevance and memory recall accuracy, only participants who had made at least one online purchase during the previous three months were included in the final sample.

3.2. Pretesting

To determine the validity of construct and comprehensibility of the questionnaire items, a pre-test was carried out before the large-scale data collection. Three marketing PhDs with sufficient experience in digital consumer behavior and e-commerce in an Indian environment reviewed the first draft of the survey instrument. They evaluated the questionnaire for measurement constructs appropriateness, wording clarity, logical flow, and item ordering. Following professional validation, pilot testing was conducted on 60 South Indian undergraduate and postgraduate students with recent history of online shopping. Convenience sampling was used in the recruitment of participants who completed the survey through an internet-based link Google Form. The pilot phase was used to examine the apparent validity, check the vagueness and confirm the cultural and contextual appropriateness of the items. Pretest results revealed adequate reliability with all Cronbach's alpha values being above 0.80, indicating excellent internal consistency (Nunnally and Bernstein, 1967). Feedback required minor adjustments to achieve greater accuracy and to suit the local online purchasing environment before executing full data gathering.

3.3. Data Collection

From January to March 2025, an online survey was conducted among South Indian online customers. 612 responses were obtained. After excluding 47 low-quality responses (i.e., duplicate responses or responses completed in <1 min) or incomplete responses, there were 565 quality responses left for final analysis. The respondent demographic characteristics are presented in Table 1. With a majority identifying as female (68.85%), followed by male participants (30.79%), and 0.35% who preferred not to

Table 1: Details about the respondents' demographics (N=565)

Variable	Category	Frequency	Percentage
Gender	Male	174	30.79
	Female	389	68.85
	Prefer not to say	2	0.35
Age group	18-24 years	216	38.20
	25-34 years	202	35.80
	35-44 years	89	15.80
	45-54 years	38	6.70
	55 years and above	20	3.50
Education level	Undergraduate degree	238	42.10
	Postgraduate degree	249	44.10
	Professional/Doctoral degree	43	7.60
	Higher secondary or below	35	6.20
Occupation	Student	205	36.30
	Employed (Private sector)	177	31.30
	Employed (Public sector)	59	10.40
	Self-employed/Business	64	11.30
	Homemaker	26	4.60
	Other	34	6.10
Online shopping frequency	Once a month or less	118	20.90
	2-3 times a month	241	42.70
	Once a week	138	24.40
	Multiple times a week	68	12.00

disclose their gender, reflecting growing engagement of women in online shopping. In terms of age, the largest respondent groups were 18-24 years (38.2%) and 25-34 years (35.8%), followed by 35-44 years (15.8%). This distribution reflects that younger and middle-aged consumers are the main audience for the internet and impulse buying, especially in socially interactive contexts. Regarding education, the majority of those surveyed held a college degree (44.1%) or a bachelor's degree (42.1%), showing that well-educated consumers dominate the live-stream shopping market in the region. In fact, the majority of respondents were either students (36.3%) or working in the private sector (31.3%), constituting a tech-savvy and income-earning segment apt to purchase online. Most respondents answered that they purchased online 2-3 times a month (42.7%) or once a week (24.4%), reflecting frequent digital purchasing behavior. Every respondent had previously engaged in live-streamed shopping within three months, and thus their answers were meaningful and current.

4. RESULTS AND ANALYSIS

4.1. Common-Method Bias (CMB)

To find out how much common method bias (CMB) might come from self-reported data, we followed the steps suggested by Kock (2015) and ran a full collinearity test using SmartPLS 4. The test can simultaneously measure vertical and lateral collinearity and effectively detect CMB in PLS-SEM. We computed variance inflation factor (VIF) values for all latent constructs by conducting individual regressions of each of them on one variable. The findings indicated that all VIF values were between 1.897 and 2.191, much less than the conservative cut-off level of 3.3 suggested by Kock (2015), and therefore, there is no issue of common method bias in this study. In addition, we performed procedural controls by maintaining anonymity, randomly assigning items to questionnaires, and keeping construct sections separate in the survey design to avoid method bias. All these statistical and procedural controls ensure that CMB does not influence our results to any significant extent.

Table 2: Results of reliability and convergent validity

Construct	Items	FL	Cronbach α	CR	AVE
CT	CT1	0.622	0.702	0.833	0.629
	CT2	0.874			
	CT3	0.857			
FE	FE1	0.773	0.726	0.8	0.643
	FE2	0.877			
	FE3	0.858			
	FE4	0.683			
IB	IB1	0.789	0.838	0.903	0.757
	IB2	0.905			
	IB3	0.911			
Perceived SP	SP1	0.640	0.721	0.836	0.635
	SP2	0.907			
	SP3	0.820			

FL: Factor loading, CR: Composite reliability, AVE: Average variance extracted

Table 3: Discriminant validity

Construct	CT	FE	IB	SP
CT	0.793			
FE	0.670	0.802		
IB	0.807	0.672	0.870	
SP	0.603	0.649	0.581	0.797

The square root of AVE is a diagonal element. A value must be greater than the inter-construct correlations in order to be deemed adequate

4.2. Measurement Model

We used SmartPLS to evaluate the model fit before examining the structural relationships between the constructs. The results provided an overall acceptable model fit. Both the saturated model SRMR (0.072) and estimated model SRMR (0.075) were below the suggested 0.08 cut-off, indicating a good fit. Likewise, Normed Fit Index (NFI) values (0.918 for the saturated model and 0.902 for the estimated model) surpassed the threshold cutoff of 0.90, affirming good model performance. Other indices of fit like d_ULS (0.578 and 0.689) and d_G (0.288 and 0.302) validated the model's goodness but noted that d_ULS is mainly information. Chi-square values (755.120 and 798.301) were comparably low, further affirming the goodness of the measurement model. These findings cumulatively demonstrate that the model offers a good and stable fit to the data, warranting further examination of the structural relationships. Second, Utilizing Cronbach's α, FL, CR, and AVE, reliability and convergent validity were investigated. All Cronbach's α values from the results listed in Table 2 are >0.7, which suggests good internal consistency. The CR values for all the constructs were >0.8, which guarantees high construct reliability. Moreover, the AVE values for all the constructs are greater than the recommended cut-off of 0.5, which guarantees good convergent validity. These results collectively guarantee good reliability and acceptable convergent validity as recommended by Fornell and Larcker (1981).Additionally, we used the square roots of AVE values and the correlations between the constructs to perform the discriminant validity test. The square root of the AVE (diagonal elements) of each construct is greater than the correlation coefficients between each construct and each other construct (non-diagonal elements), as shown in Table 3. The

evidence presents a good and acceptable discriminant validity level, as promoted by Fornell and Larcker (1981). Figure 2 displays the measurement model.

4.3. Structural Model and Hypotheses Testing

All direct paths were supported, as demonstrated by the findings in Table 4. H_1 is supported by the positive and significant influence of perceived SP on consumers' impulsive buying behaviour ($\beta = 0.169$; $P < 0.001$). In addition, consumers' FE is positively influenced by perceived SP ($\beta = 0.649$; $P < 0.001$), which supports H_2. H_3 is validated by the FE's strong direct impact on IB ($\beta = 0.207$; $P < 0.001$). In addition, H_5 is supported by the significant effect of perceived SP on CT ($\beta = 0.603$; $P < 0.001$). Finally, H_6 is supported by the statistically significant direct relationship between CT and impulsive buying behaviour ($\beta = 0.628$; $P < 0.001$). These results form the basis for the further mediation analysis under H_4 and show

Figure 1: Conceptual framework and hypotheses

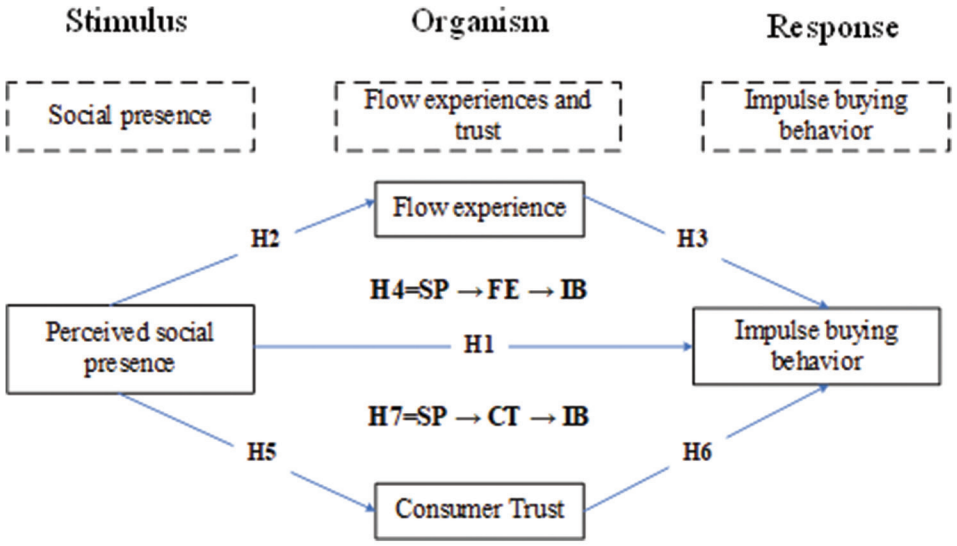

Figure 2: Measurement model

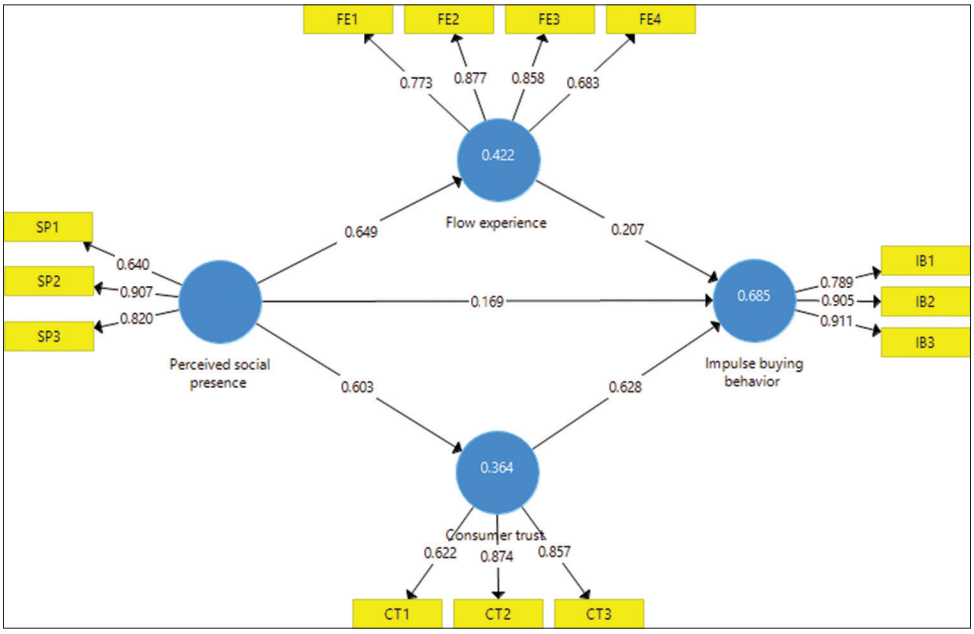

Table 4: Results of paths analysis

Hypothesis	Paths	Standardized path coefficient (β)	T Statistic	P-value	Result
H_1	Perceived social presence→Impulse buying behavior	0.169	4.567	***	Supported
H_2	Perceived social presence→Flow experience	0.649	27.376	***	Supported
H_3	Flow experience→Impulse buying behavior	0.207	5.306	***	Supported
H_5	Perceived social presence→Consumer trust	0.603	19.732	***	Supported
H_6	Consumer trust→Impulse buying behavior	0.628	15.667	***	Supported

***P<0.001

that both FE and CT are significant mediators. Figure 3 displays the structural model.

4.4. Mediating Effect Analysis

We conducted a bootstrapping analysis with 5,000 replicate samples at a 95% confidence level to investigate whether FE and CT act as mediators. The results of the mediation test are shown in Table 5. The results support H_4 by showing a positive relationship between perceived SP and IB influenced by the FE ($\beta = 0.134$, LLCI = 0.084, ULCI = 0.186, $P < 0.001$). This implies that FE plays a key mediating role in the relationship between perceived SP and consumers' impulsive purchasing behavior. Additionally, through CT, perceived SP also has a positive relationship with IB, supporting H_7 ($\beta = 0.379$, LLCI = 0.319, ULCI = 0.445, $P < 0.001$). This suggests that the relationship between SP and IB is significantly mediated by CT as well.

5. DISCUSSION AND IMPLICATIONS

The findings of this study empirically confirm the theoretical model grounded in the S-O-R model and support the hypothesized hypotheses. Precisely, the direct effect hypotheses (H_1-H_3, H_5, and H_6) and the mediation hypotheses (H_4 and H_7) were supported using the data, and the findings on the mechanisms by which perceived SP impacts IB in online purchasing situations are presented.

First of all, our research confirmed that perceived SP has a positive influence on impulse buying behaviour (H_1). This is in line with previous research (e.g. Li et al., 2022; Feng et al., 2024) showing that SP in the form of human-like interaction, chat functionality or real-time interaction increases consumers' emotional activation and their impulsive buying propensity. When consumers feel a high level of interactivity or perceive the presence of others (e.g. salespeople, other consumers), their cognitive resistance is lowered and they buy more impulsively. In formats with high interactivity such as live stream shopping or social media, this perceived presence bridges the gap between digital interaction and human warmth and makes the user open to impulse stimuli.

Second, the perception of SP was found to have a significant impact on the FE (H_2), confirming that social cues and interactivity in online environments lead to more presence and immersion. Consumers who are in a state of flow—a state of extreme absorption and enjoyment—are less thoughtful and more action-orientated, paving the way for impulse purchases. As H_3 suggests, the FE is a strong predictor of impulse buying, confirming previous research that cites flow as a precursor to impulsive consumption (Shahpasandi et al., 2020; Huo et al., 2023). These results support the notion that the more intense and captivating the shopping experience, the more likely customers are to bypass considerations in favour of immediate gratification.

Third, mediation analysis confirmed H_4 and H_7 in that the FE and consumer confidence are psychological bridges between perceived SP and IB. In particular, perceived SP was found to influence impulse buying indirectly through FE and through

Figure 3: Structural model

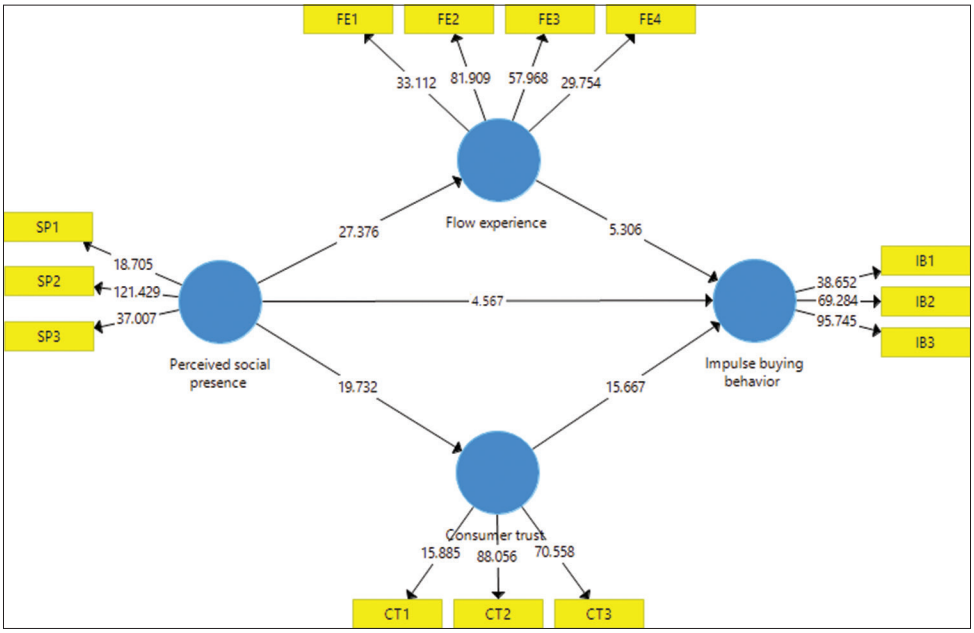

Table 5: The mediation effect's outcomes

Mediation paths	Indirect effects (β)	LLCI	ULCI	P-value	Result
Perceived social presence→Flow experience→Impulse buying behavior	0.134	0.084	0.186	***	H_4 supported
Perceived social presence→Consumer trust→Impulse buying behavior	0.379	0.319	0.445	***	H_7 supported

LLCI: Lower-level confidence interval, ULCI: Upper-level confidence interval. ***P<0.001

the establishment of CT. Verification of H_4 demonstrates that interpersonal warmth and immediate interaction not only foster enjoyment and concentration but also place consumers in an emotional state in which they are likely to make impulsive purchases. Similarly, H_7 demonstrates that CT mediates between SP and impulse buying. In keeping with trust transfer theory, where platforms emulate human interaction, users feel safer and more secure in transactions even when there is no physical verification. Such trust reduces perceived risk and accelerates the decision-making process. The results provide solid support for the dual mediation approach, combining both cognitive (confidence) and affective (flow) pathways to explain the role of SP in impulse buying. The combined explanation fills a significant gap in the literature, which has so far focussed on a single mediator. The results also confirm that perceived SP in the S-O-R model not only contributes to arousal, but also has a cascading effect on internal states and behavioural outcomes.

5.1. Theoretical Implications

By filling key knowledge gaps about the psychological and experiential processes underlying IB in online shopping contexts, especially from a perspective of perceived SP, this study further extends theoretical accounts of Internet consumer behavior research.

Firstly, while much of the factors that lead to impulse buying online has been researched previously, not enough attempts have been made to synthesize SP and psychological states into a cohesive framework. Using a two-bead S-O-R model, this study comes up with a conceptual model taking into account the consumer confidence (cognitive state) and FE (affective state) as significant organismic mediators that have impacts on impulsive buying behavior, coupled with SP as an environmental stimulus. This two-pronged approach fills the gap in the literature where most existing research only discussed either an emotional or a cognitive pathway without endeavoring to combine the two. Second, the study contributes theoretically by empirically confirming consumer FE and trust as interdependent but discrete mediators of the SP-impulse purchase relationship. While flow has been widely examined in gamification and hedonic consumption contexts, its mediating variable role in e-commerce, as moderated by human-like cues, has barely been explored. Although trust is known to be an antecedent of purchase intention, this study sheds light on its mediating role in impulsive, affect-driven purchase behavior, especially when trust is moderated by social cues.

5.2. Managerial Implications

From a practical perspective, the findings provide several actionable observations for online retailers, live streaming platforms and e-commerce marketers looking to maximise consumer interaction and drive impulse purchases.

Firstly, the large impact of perceived SP on consumer FE and trust shows that human-centred design methods play an essential role in shaping consumer behaviour. E-commerce websites need to invest in interactive tools such as live chat, human-like avatars, video presentation and real-time feedback to create a socially engaging shopping experience. These features mitigate the impression of impersonality, encourage emotional connection and increase psychological consumer engagement.

Secondly, platform manufacturers should set the shopping experience as a design goal. User-friendly navigation, engaging product stories and smooth live streaming with high-quality rich media features are some ways to achieve this. By reducing thought and increasing enjoyment, such immersive experiences not only keep customers engaged but also encourage impulsive purchases.

Thirdly, the findings emphasise the importance of building CT through socially embedded indicators. It is important to emphasise trust indicators such as verified reviews, live customer support, open pricing and shipping, and active customer questions. To increase credibility and buyer trust, sellers need to partner with hosts or influencers who come across as approachable, knowledgeable, and natural.Lastly, when rolling out sales promotions, balancing discounting with perceived value is very important. Overdoing low prices may make customers equate the product with inferior quality. Marketers thus need to position promotions as exclusivity, limited availability, or bundled value, but not steep discounting.

6. CONCLUSION

In the changing digital commerce environment, it is important to understand the psychological and social processes that govern consumers' IB. The present research explored the role of perceived SP in governing IB through the intervening roles of FE and CT, within a modified S-O-R model. Based on empirical evidence and structural equation modelling, the study validated six direct hypotheses and two mediating hypotheses, providing a robust theoretical framework for understanding spontaneous buying behaviour in an online context. Our results suggest that SP has a significant direct effect on consumers' FE and CT, which in turn influence spontaneous purchase behaviour. The results also confirm the mediating effect of affective involvement (FE) and cognitive trust (CT), thus extending our knowledge of how experiential and interpersonal cues influence consumers' in-the-moment purchase decisions. These findings not only confirm the applicability of the S-O-R model in online shopping environments, but also demonstrate the multilevel nature of consumer psychology in cyberspace. By incorporating emotional, cognitive and situational variables into a single overall framework, the research makes important theoretical contributions and practical managerial recommendations for optimizing consumer engagement and buying behavior in e-commerce websites.

7. LIMITATIONS AND FUTURE SCOPE

The study has a number of limitations that provide routes for future research.

Although perceived SP and CT were the focal points of this research, other significant experiential dimensions like entertainment value, interactivity level, or peer influence were not considered in this study. Future studies may extend the model to

consider these factors as well to gain a more complete picture of consumer experience in online purchase environments. Second, the present study concentrated on impulse buying as an overall construct. Impulse buying does occur in several different forms including reminder impulse buying, suggestion impulse buying, and unplanned buying. Future research can isolate these subtypes to investigate subtle consumer motives and evokers. Third, the data for this research was gathered from one country only, which restricts the overallizability of the results. Since cultural norms and technological usage vary across regions, cross-cultural research is suggested to explore how cultural and regional differences mediate the relationship among SP, flow, trust, and impulse purchasing. Fourth, whereas this study considered perceived SP, follow-up research may separate machine-generated versus human-generated interactions, e.g., chatbot-mediated purchases versus influencer commerce, to compare their relative effects on trust and impulsiveness. Lastly, while the current study sheds important light on online consumer behavior, it employed a cross-sectional design. Future research can use experimental or longitudinal designs to track behavioural dynamics in a time series and determine causal relationships. Given these limitations, research can improve our theoretical and practical understanding of impulse buying in online retailing, especially as online shopping becomes more sophisticated.

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