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The Influence of AI-Based Product Recommendation Systems on Impulse Buying in Mobile Commerce

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Abstract

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The article investigates how AI based product recommendation systems shape impulse buying in mobile commerce, focusing on when personalized suggestions intensify unplanned purchasing. It asks how recommendation features and mobile interface cues are conceptualized as stimuli, which psychological mechanisms link them to impulsive outcomes, and which contextual or consumer factors condition these effects. Using a systematic literature review of peer reviewed studies published between 2018 and 2022, the study extracts data on theoretical frameworks, mobile settings, recommendation designs, measures of impulse buying, and reported mediators and moderators. The synthesis shows that AI based recommendations typically raise perceived relevance, reduce search effort, and guide attention, which strengthens positive affect, perceived value, flow, and urge to buy, especially in hedonic and socially rich mobile environments. Evidence also highlights moderating roles of demographic characteristics, social influence, and privacy concerns, while revealing heavy reliance on cross sectional self-report designs. The review identifies key gaps in causal evidence, algorithmic transparency, and ethical considerations around AI mediated impulse buying.

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1. Introduction

Mobile commerce has transformed how consumers search, evaluate, and purchase products, creating ubiquitous, personalized, and highly interactive shopping environments. The portability of smartphones and continuous connectivity make mobile shopping especially conducive to spontaneous decisions, and empirical studies show that mobile interfaces can intensify impulse buying through hedonic browsing, convenience, and real time exposure to persuasive cues (Zheng et al., 2019; Zhang et al., 2022). Within these environments, impulse buying is typically defined as unplanned, immediate purchases triggered by situational stimuli and accompanied by strong affective reactions. Recent work in mobile commerce adopts the stimulus-organism-response framework to explain how mobile interface features, perceived value, and social influence shape internal states and impulse buying behavior, highlighting the roles of hedonic value and interpersonal influence in strengthening the urge to buy impulsively (Zheng et al., 2019; Yang et al., 2021).

AI based product recommendation systems have become central components of mobile commerce platforms. These systems rely on machine learning algorithms to analyze large volumes of behavioral and contextual data, including past purchases, clickstream patterns, and in app interactions, to generate personalized product suggestions in real time (Xiao et al., 2020; Li et al., 2022). Prior research indicates that personalized recommendations can increase perceived relevance, reduce search effort, and guide attention to items that consumers might not have actively considered, which in turn raises conversion rates and sales (Li et al., 2022). Evidence

from social and mobile commerce further shows that product recommendations can directly heighten the urge to buy impulsively by shaping affective trust and product affection in recommendation rich environments (Chen et al., 2019; Ampadu et al., 2022). These findings suggest that AI based recommendations may not only support planned purchases but also act as powerful stimuli that trigger impulsive buying in mobile settings.

Despite rapid progress, the literature on AI based recommendation systems and impulse buying remains fragmented. Studies of mobile impulse buying often focus on interface design, situational cues, or browsing motives, treating recommendation systems as part of the background environment rather than as focal stimuli (Zheng et al., 2019; Zhang et al., 2022). Conversely, research on recommender systems typically emphasizes purchase intention, click through, or revenue outcomes without distinguishing clearly between planned and impulsive purchases or considering mobile specific interaction patterns (Chen et al., 2019; Xiao et al., 2020; Li et al., 2022). Only a limited number of contributions directly integrate AI driven recommendations, psychological mechanisms, and impulsive outcomes in a coherent model (Yang et al., 2021; Ampadu et al., 2022). This article addresses these gaps by conducting a systematic literature review of peer reviewed studies published between 2018 and 2022 that examine the influence of AI based product recommendation systems on impulse buying in mobile commerce. The review synthesizes theoretical perspectives, mobile design features, algorithmic approaches, and behavioral outcomes, and identifies research opportunities for clarifying the

mechanisms, boundary conditions, and ethical implications of AI mediated impulse buying in mobile shopping environments.

2. Literature Review

The literature on impulse buying in digital channels has increasingly focused on how mobile environments shape unplanned purchases. Studies in mobile and online commerce show that impulse buying is driven by a combination of interface stimuli, affective reactions, and situational factors, often conceptualized through a stimulus organism response perspective that links environmental cues to internal states and purchase outcomes (Zheng et al., 2019; Yang et al., 2021). Meta analytic evidence further organizes online impulse buying drivers into website, marketing, and affective stimuli, and demonstrates that visual appeal, ease of use, promotions, pleasure, and positive emotion are consistently associated with higher impulsive purchasing (Zhao et al., 2022). In mobile contexts, additional features such as gamification, real time interaction, and situational triggers can intensify hedonic value and the urge to buy, with gamified elements shown to increase online impulse buying and to interact with consumer characteristics such as gender and age (Zhang et al., 2021; Zhang et al., 2022).

Parallel streams of research examine how AI based and data driven recommendation systems influence consumer responses in e commerce and social commerce. Product recommendation studies provide early evidence that algorithmic and social recommendations heighten the urge to buy impulsively by enhancing affective trust in the recommender, product affection, and perceived diagnosticity of

suggested items (Chen et al., 2019; Zafar et al., 2021). More recent work on personalized recommended product quality shows that high perceived quality of online personalized recommendations can increase satisfaction, positive image, and electronic impulse buying, highlighting the role of recommendation content and presentation in shaping impulsive outcomes (Ampadu et al., 2022). In mobile settings, AI based personalized recommendations rely on behavioral and contextual data to deliver real time suggestions that are sensitive to privacy concerns and contextual cues, with evidence that such models can improve relevance and engagement when carefully aligned with user expectations (Xiao et al., 2020; Li et al., 2022).

Despite these advances, there is still limited synthesis of research at the intersection of AI based product recommendation systems, mobile commerce, and impulse buying. Existing work tends to isolate psychological mechanisms of impulse buying from algorithmic and design choices in recommender systems, or to treat mobile platforms as generic online environments without examining mobile specific interaction patterns such as in app browsing, push notifications, and micro moments of use (Yang et al., 2021; Zhang et al., 2022). Reviews and systematic literature studies address online impulse buying or social commerce more broadly but do not systematically differentiate AI driven recommendation stimuli from other digital cues (Abdelsalam et al., 2020; Zhao et al., 2022). The present systematic literature review responds to this gap by integrating findings from 2018 to 2022 on AI based recommendation mechanisms, mobile interface features, and impulsive purchase

outcomes, with the aim of clarifying how recommendation design, consumer states, and mobile contexts jointly shape impulse buying in mobile commerce.

3. Methods

The study adopts a systematic literature review design to synthesize current knowledge on the influence of AI based product recommendation systems on impulse buying in mobile commerce. The review focuses on peer reviewed empirical and theoretical studies published between 2018 and 2022. Relevant articles were identified through structured searches in major academic databases, including Scopus, Web of Science, ScienceDirect, IEEE Xplore, ACM Digital Library, and Google Scholar, using combinations of keywords such as "mobile commerce", "m commerce", "impulse buying", "impulsive purchase", "recommender systems", "product recommendation", and "artificial intelligence". The search was restricted to English language publications in journals and high-quality conference proceedings. After removing duplicates, titles and abstracts were screened to exclude studies unrelated to mobile or online shopping, non-AI based recommendation mechanisms, or general consumer behavior without explicit consideration of impulsive purchasing. Full texts of the remaining papers were then assessed against predefined inclusion and exclusion criteria centered on the presence of mobile contexts, AI or algorithmic recommendation systems, and impulse buying constructs.

For each eligible study, a standardized data extraction template was used to capture bibliographic information, research context, theoretical framework,

methodological approach, characteristics of the recommendation system, operationalization of impulse buying, key findings, and reported limitations. Where relevant, information on recommendation algorithms, data sources, mobile interface features, and mediating or moderating psychological variables was also recorded. A simple quality appraisal considered clarity of research design, transparency of measurement and analysis, appropriateness of methods, and alignment with the review focus. The extracted data were synthesized narratively and organized around four themes: conceptualizations of AI based recommendations and impulse buying in mobile commerce, design and algorithmic features of recommendation systems, identified mechanisms linking recommendations to impulsive behavior, and contextual or consumer factors that condition these effects.

4. Results and Discussion

The review shows that existing work at the intersection of AI based recommendation systems, mobile commerce, and impulse buying is theoretically anchored but empirically fragmented. Across the included studies, impulse buying in mobile or highly interactive online environments is predominantly modelled using a stimulus organism response perspective, sometimes combined with value or flow-based views (Chen & Yao, 2018; Zheng et al., 2019; Yang et al., 2021). AI based recommendations, mobile interface features, and promotional cues are treated as external stimuli that shape internal states such as positive affect, perceived value, trust, and flow, which in turn generate urge to buy impulsively and actual impulsive purchases (Yang et al., 2021; Zhang et al., 2022; Zhao et al., 2022). Mobile specific

determinants highlighted across studies include hedonic browsing, architectural quality of apps, promotion campaigns, and the convenience and ubiquity of mobile access, which together create a fertile environment for unplanned purchases (Chen & Yao, 2018; Zheng et al., 2019; Zhang et al., 2021).

Within this broader stream, research that explicitly examines AI based product recommendation systems indicates a consistent positive association between personalized recommendations and impulsive outcomes. Product recommendation studies in social and mobile commerce contexts find that algorithmic recommendations heighten the urge to buy impulsively by increasing affective trust in the recommender, product affection, and perceived diagnosticity of suggested items (Chen & Yao, 2018; Chen et al., 2019). Work on personalized recommended product quality shows that when consumers perceive recommendations as high quality and well matched, they report stronger satisfaction, a more positive image of the platform, and higher electronic impulse buying (Ampadu et al., 2022). Studies of AI driven and data driven recommender systems further show that real time, context aware suggestions reduce search effort, direct attention to attractive alternatives, and increase conversion, although they usually operationalize outcomes as purchase intention or overall sales rather than clearly separating planned and impulsive purchases (Xiao et al., 2020; Li et al., 2022).

The review also highlights that psychological and contextual mechanisms condition the strength of AI induced impulse buying. Research in mobile and social commerce emphasizes the mediating roles of perceived value, enjoyment, flow, and social influence, indicating that recommendation systems are most effective in

triggering impulsive purchases when they enhance hedonic value and are embedded in socially rich or persuasive contexts (Zheng et al., 2019; Yang et al., 2021; Hoang & Khoa, 2022). Segment based analyses show that demographic characteristics such as age and gender can change the impact of gamification, promotions, and recommendation rich environments on impulse buying, with younger segments and more hedonic oriented consumers generally more responsive (Zhang et al., 2021; Cavazos-Arroyo & Máynez-Guaderrama, 2022). At the same time, concerns about privacy and perceived intrusiveness appear as potential brakes on engagement with mobile personalized recommendations, suggesting a tension between persuasive effectiveness and user comfort (Abdelsalam et al., 2020; Xiao et al., 2020).

Taken together, the findings suggest that AI based product recommendation systems in mobile commerce do not create impulse buying in isolation, but operate as part of a broader socio technical configuration that includes interface design, promotional tactics, social and situational cues, and individual traits. However, only a subset of studies directly model recommendation features, algorithmic characteristics, and mobile interaction patterns as focal variables, and very few use causal designs that can separate the incremental impact of AI based recommendations from other stimuli. The evidence base is therefore stronger on correlational patterns and mediating mechanisms than on clear causal estimates of AI recommendation effects on impulsive purchases. Future empirical work that combines fine grained behavioral data, experimental or quasi experimental designs, and explicit modelling of recommendation algorithms would help clarify when and

how AI based product recommendation systems in mobile commerce amplify impulse buying and how these effects interact with ethical and regulatory concerns.

5. Conclusion

This systematic review indicates that AI based product recommendation systems in mobile commerce are consistently associated with stronger urges to buy and higher levels of impulsive purchasing, but that these effects emerge within a broader configuration of mobile interface design, hedonic browsing, social influence, and individual traits. Across the studies, recommendations operate as salient stimuli that increase perceived relevance, reduce search effort, and direct attention to attractive alternatives, which in turn heighten positive affect, perceived value, and flow experiences. Together, these mechanisms help explain why mobile platforms that combine personalization with rich, interactive features can be particularly fertile ground for impulse buying.

At the same time, the evidence base is limited in ways that affect how confidently the findings can be generalized. Most studies rely on cross sectional survey designs, self-reported measures of impulse buying, and single country or single platform samples. This makes it difficult to rule out alternative explanations, to distinguish clearly between planned and unplanned purchases, or to assess the stability of the observed relationships over time and across cultural or regulatory contexts. Many papers provide only high-level descriptions of the underlying recommendation algorithms and data inputs, so it is often unclear whether the systems studied are genuinely AI driven or simpler rule-based engines. These gaps

reduce transparency, constrain replication, and introduce uncertainty about which technical and design choices actually matter for impulsive outcomes.

Building on these limitations, future research should move toward more rigorous and fine-grained designs that combine behavioral log data with experimental or quasi experimental approaches, allowing stronger causal claims about the incremental impact of AI-based recommendations on impulse buying. Studies that explicitly model different algorithmic strategies, levels of personalization, and interface presentations would help disentangle which aspects of recommendation systems are most potent in triggering impulsive purchases and for whom. There is also a need to examine longer term consequences, such as satisfaction, regret, and relationship quality, and to integrate ethical and regulatory perspectives on persuasive design, privacy, and potential harm from excessive impulsive buying. By addressing these issues, subsequent work can provide both a more robust theoretical account and more actionable guidance for designing recommendation systems that balance commercial objectives with consumer well-being in mobile commerce.

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