

The Impact Mechanism of Social Media Algorithmic Recommendations on Consumers' Impulse Buying

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Abstract. As a result of developments in artificial intelligence technologies, there has been an increase in recommendation systems on social media platforms, with a focus on providing personalized product and service recommendations for end-user consumption. As a result, there has been a paradigm shift in the manner by which buying decisions have been made among consumers. A literature and theoretical analysis will be employed within this research with the objective of exploring and interpreting the manner in which algorithm-driven product recommendations on social media platforms affect impulse buying among consumers. A detailed theoretical framework will be put forth with a focus on cognitive processes and behavior, affective pathways, and purchases. The theoretical result highlights that algorithm-driven recommendations have an overall influence on impulse buying and affect it through cognitive pathways, affective pathways, and purchases. Based on these theoretical interpretations, a three-way perspective approach will be adopted. It provides a theoretical lens for understanding algorithm-driven consumer behavior, offers practical implications for platform optimization and policy formulation.

Keywords: Social Media, Algorithmic Recommendation, Impulse Buying, Impact Mechanism, Consumer Behavior

1. Introduction

As a result of accelerated advancements occurring within mobile Internet technologies and artificial intelligence, online social networking sites have become prominent tools in defining and directing modern consumption patterns among buyers. Through AI-powered recommendation tools, various online behavior variables such as webpage views, "like" interactions, comments, and online purchases are tracked and analyzed with the objective of offering personalized product recommendations to online buyers [1].

It is evident from empirical research that more than 40% of online consumption behavior can be attributed to impulse buying, with online social environments having an impact on an increase in impulse buying tendencies [2]. By using methods like collaborative filtering, content filtering, and deep learning, online recommendation tools display product information dynamically and with interactive user engagement with entertaining materials, thus lowering cognitive overload and enabling consumption due to impulse as well as affective responses. Artificial Intelligence (AI)-based online recommendation tools thus enable user interactions with impulse buying tendencies.

Younger generations are more vulnerable to these tendencies, with Millennials being more amenable to online recommendations than Generation Z individuals [1].

Algorithmic recommendation systems improve impulse buying behavior based on cognitive ease, efforts to generate feelings of scarcity, social proof, and bonding as factors [3]. It should be noted that there have been several instances linked with ethical and societal issues regarding the impact of algorithm-driven recommendation systems on impulse buying as seen on social media platforms. It will be highly significant to have a deep understanding on how the process works.

2. Literature review

Nevertheless, there has been a recent surge in academic research on the topics of social networking, recommendation algorithms, and impulse buying among online shoppers. In relation to recommendation algorithms, personalized recommendation systems based on collaborative filtering and artificial intelligence technologies have been proven to improve online shoppers' buying intentions and impulses [4]. AI-powered personalized recommendation plays a pivotal role within e-commerce because it allows for developing recommendation and expenditure strategy formulation based on online shoppers' buying behavior data and preferences [5].

Regarding the perspective of consumer behavior within the given social media scenario, it can be seen that there has been considerable convergence of buying and interacting on social media platforms. Variables such as social media influencers and user-generated content have shown impressive effects on the buying decisions made by consumers [6]. The research on Generation Z and impulse buying on platforms like Instagram reveals that purchases made on these platforms are mostly unplanned and impulse driven. The role of meta-analytic research suggests that there are considerable gaps in impulse buying on online and offline platforms, and with advancements in technological developments, consumers have become vulnerable to impulse buying because of immediate stimulus effects [7].

As regards impact mechanisms, current research uses primarily the theoretical framework for Stimulus-Organism-Response (SOR) with a focus on algorithm-driven recommendations' impact on the psychological states and responses of consumers via technical variables and situational variables [2]. It is shown that algorithm-driven recommendations have an impact on impulse buying intention based on perceived usefulness and perceived enjoyment. Although AI-assisted personalization can reinforce consumer engagement and loyalty, it depends on perceived usefulness and ease of use [8].

From an emotional drivers perspective, Fear of Missing Out (FOMO) stands out as an influential motivator for impulse buying. FOMO, as an emotion associated with a pervasive anxiety triggered by the fear of missing out on valuable experiences enjoyed by others, plays an extremely essential role in social media marketing [9]. Various research works have ascertained that social media marketing impacts buying intentions because FOMO functions as an extremely essential mediating variable that separates social media marketing and buying intentions. Within the online live streaming platform e-commerce framework, FOMO and social proof stand out as influential motivators encouraging impulse buying acts [10]. Notably, very high intensities of FOMO have been seen to result in reduced mental, social, and financial well-being due to the fact that impulse buying driven by FOMO leads to compromised financial well-being as conceptualized by Bartosiak et al. [11]. Social proof and product exclusivity/limited-access driven FOMO associated with modern marketing driven by emotional drivers like young people belonging to Generation Z proactive purchases as conceptualized [12].

From an ethical and privacy issue perspective, matters pertaining to data privacy, bias within algorithms, as well as manipulating consumer behavior have become more prominent. The

transparency and fairness within algorithms have become fundamental issues, and as a result, there is a need for incorporating ethical considerations within algorithm designs to curb bias and manipulating customers [13]. Regarding sustainable consumption, despite the fact that almost two-thirds of price-conscious consumers voice environmental worries, less than a quarter show consistent behavior based on these worries. Personalized recommendation systems might be widening this attitude–behavior gap. As a result, modern consumers get tempted to undertake unnecessary impulse purchases. As White et al. [14] declare: Although there have been studies conducted on the impact of social media algorithm recommendation on impulse buying, there are still several gaps. First, impact mechanism analyses have not been systematically incorporated, with a shortage of theoretical frameworks addressing cognition, emotions, and motivation. Second, there have been fragmented discussions on moderating variables without thoroughly exploring the diverse impacts caused by algorithm recommendation. Third, there have been insufficient considerations on ethical and societal impacts, leading to a shortage of systematic recommendations on a theoretical foundation based on a consumer protection perspective. Based on previous research, this research aims at developing an overall theoretical framework and identifying various impact and moderating variables on which algorithm recommendation affects impulse buying and developing recommendations.

3. Analysis of impact mechanism

3.1. Cognitive mechanism

Recommendation algorithms can significantly reduce search costs for consumers through information filtering and precise matching. Typically, in traditional shopping environments, it becomes necessary for customers to personally search and compare various pieces of product information. By contrast, recommendation systems based on collaborative and content filters can screen candidates from a large product set and then push targeted information toward customers. Therefore, the push-based dissemination method reduces cognitive costs on the customer side.

Nevertheless, it also poses cognitive problems. As consumers increasingly rely on algorithmic recommendations and receive suggested information with minimal cognitive effort, they might be at risk of undermining their critical thinking and rational analysis skills. Algorithmic recommendations usually combine visualization, dynamics effects, and elements that evoke a sense of urgency aimed at attracting as much user attention as possible. Within an immersive user experience while consuming online content on social media platforms, so-called "mindless browsing" becomes common, and decision-making becomes more driven by intuition and emotions instead of reason.

3.2. Emotional mechanism

Algorithms-based recommendation influences impulse buying as it moderates and guides affect experiences. Affect experiences result in highly relevant contents, thus improving user satisfaction. As recommended goods and services meet user needs, they stimulate affect experiences linked with feelings of being valued and understood, and these feelings reduce perceptions of risk and amplify purchasing impulses. As users are engaged and entertained while browsing online, recommendation algorithms display goods and services with high relevance linked with affect experiences.

Furthermore, recommendation messages based on algorithms incorporate feelings of urgency and scarcity via limited-time promotions and stock alerts, thus engaging the FOMO on behalf of the consumer. Feelings of urgency engage the loss aversion principle and generate a buying paradigm

based on loss instead of gain, thus enhancing impulse buying. Within live streaming online market platforms, vendors screen "limited-time flash sales" and "low stock" conditions; merging these concepts with algorithm-based recommendation messages, considerable synergy occurs among temporal and social elements, thus triggering impulse buying.

Third, algorithm-driven recommendations use a social process with a focus on creating social identity and convergence by comparing with people's buying choices, judgments, and recommendations. The idea of social proof works as an incentive for people to believe that "if everyone else is buying it, then I should buy it too" based on purchases made by friends, influencers, and millions of people. Algorithms are used with components like "your friends like this product" and "100,000 people have bought this" to create more pressure and convergence socially. Social influencers and user-generated videos like comments, unboxing, and short videos can generate emotions, and algorithm-driven recommendation systems increase impulse buying with more emotive videos.

3.3. Purchasing motivation mechanism

The recommendation system has a direct impact on the customer's purchasing motivation as it encourages impulse buying. From the perspective of stimulating needs, some products of user interest that they have not searched for are suggested on these platforms. For instance, a user watching fitness videos might get recommendations for gym equipment, and a user who follows a particular influencer might get exposed to things offered by that influencer. It might generate a sense of "this is exactly what I need" among customers even though they were not aware of these needs before. When these pieces of content have an association with user needs and are accessed at a stage of positivity and active engagement, the impact on purchasing motivation will be more. Regarding reduced execution costs associated with purchases, functionalities like "one click purchasing" and "quick payment" on social media sites have considerably reduced the time period from viewing an item to its completion. Products suggested on online purchases are directly connected to purchasing pages. As a result, purchases occur with a limited number of click actions. It becomes less likely for people to have buyer's remorse. Purchase risk factors are considerably eliminated because fast distribution services and return and exchange services are also easy. The interactive feature of online social media reduces feelings associated with execution costs. The algorithmic recommendation on social media platforms affects factors relating to impulse buying among consumers comprehensively via three closely interlinked and mutually enhancing processes: cognition, emotions, and purchase motivation, which make up a complete process through which algorithmic recommendations impact consumer actions.

4. Countermeasures and suggestions

4.1. Consumer level

Consumers should be more aware of the dangers of impulse buying and improve their skills for making rational decisions. Before buying anything, consumers should set up clear shopping lists and constraints on their budget. When they are exposed to recommended goods, they should wait for a period before making a buying decision so as not to rely on impulse purchases influenced by momentary feelings. Moreover, it is necessary for consumers to be aware of the logic involved in these recommendations and not believe that these videos are completely objective and unbiased.

Consumers can mitigate the impact of recommendations by configuring platform settings. These steps include turning off personalized recommendation functions, suppressing push notification rates, and minimizing overall usage duration. Functions of "interest management" to personally choose types of contents, and additional tools like list-based shopping apps and budgeting softwares, can also be useful for monitoring consumption practices. Improving digital literacy, involving algorithmic literacy and knowledge about working mechanisms of recommendation platforms, data collection procedures, and data-protection tools, helps build capabilities among consumers to better separate information and protect themselves.

4.2. Platform enterprise level

Platforms should enhance user understanding and transparency on recommendation algorithm systems with detailed information on recommendation processes and methods, as well as user data usage. Platforms should enable easy access and understanding of user data usage and should identify recommended services as 'Advertisement' and 'Personalized recommendation' to assist users in understanding which services are organic and which are advertisements. Platform users should be capable of viewing and controlling personal data. These factors will help raise user satisfaction and trust and enable platforms to achieve sustainability.

Platforms should achieve a balance between business goals and user well-being, optimize recommendation algorithms so as not to overly influence user behavior, and remove "dark patterns" like deceptive countdown timers and misleading stock notifications. Platforms should be able to provide multiple recommendation services so as not to trap users inside an information cocoon, set up a cooling-off period system so that users are reminded of frequent and quick consumption, and set up an "add to wish list" service for high-value goods. Functions for "responsible recommendation" that offer consumption pattern displays, budgeting services, and pages for promoting rational consumption can improve user experience.

Platforms should improve services relating to after-sales and user protection. Such services include offering remedies for return and exchange, solving complaints, improving supervision of merchants against products, and combating false advertising. Adding a "consumer education" page on the platform providing knowledge and tools for rational consumption, identifying false information, and ensuring personal and data privacy can be a vital step. Use of online credit platforms will be encouraged once these factors are put into consideration. Creating an account on the platform will be made easier.

4.3. Regulatory authority level

It is necessary that regulatory bodies expedite the development of the legal and regulatory framework pertaining to algorithmic recommendations, data privacy, and consumer protection. The regulatory bodies should formally define the status and liability framework for algorithmic recommendations, lay down the responsibilities and duties of online platforms relating to algorithm design and development, data collection and dissemination, and improve data-privacy safeguards with specific demands on user consent for data collection and use, and formulate prohibitive guidelines on improper uses, as indicated by 'dark patterns.' The legislation should remain up to date with technological advancements and business innovations.

It is recommended that a system for review and evaluation of algorithms should be put in place by the regulatory bodies, requiring regular platform disclosures about the fundamental principles of algorithms, sources, and results of impact evaluations. Third-party audits should be encouraged, as

should algorithmic-ethics reviews. A system for response to algorithmic accidents should be put in place for immediate investigations and penalties for harm inflicted on the rights and interests of consumers as a result of suggested actions. Moreover, the government should improve the protection of consumer rights by promoting convenient procedures for complaints and resolution of disputes, making it easier to gain benefits and imposing tougher penalties on actions that violate legitimate rights and interests. Public and educational efforts are necessary for better understanding among people about algorithm recommendation systems and rational consumption. Active involvement of nongovernmental bodies working on consumer rights and addressing special needs of vulnerable sections are also necessary.

5. Conclusions

This research carries out a thorough and methodical analysis on the mechanism of impact brought about by algorithmic recommendation on consumption impulse purchases made on social media sites. It develops a theoretical framework on cognitive, affective, as well as purchasing motivation mechanisms.

The theoretical contribution here is based on an integrated framework that explains various mechanisms and paths by which algorithmic recommendation influences impulse buying behavior among consumers. Regarding an answer to a practical problem, it helps consumers grasp various impact mechanisms and acquire knowledge and awareness for platform enterprises on optimizing their strategy and theoretical foundations and references for authorities on developing policies and regulations. Due to rapid developments in artificial intelligence and changes brought about by the digital economy era, algorithmic recommendation acts as a salient bridge between consumers and products. It becomes an essential task and a challenging academic issue to grasp and make sense of its impact mechanism because it occupies prime importance not only as an academic issue but also as an issue requiring an immediate solution. It demands collective efforts on the part of academia, enterprises, and authorities.

The research recognizes that there are some limitations. The first is that it does not use empirical research but focuses on a literature review and theoretical research without testing and confirmation. The second limitation is that it does not offer an elaborate discussion on the uneven effects of various algorithm recommendation methods. The third limitation is that it centralizes on the unfavorable impact of algorithm recommendation on impulse buying. The research paths include cross-cultural comparisons, exploring long-term algorithm recommendation effects, researching interactions with various other marketing methods, and finding algorithm recommendation avenues for ethics and responsible designs.

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