

Impact of Instagram Algorithms On User Content Preferences and Engagement Patterns: Evidence from A Mixed-Methods Study of Digital Platform Users

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Abstract

Purpose

The aim of this research is to explore the impact of Instagram's algorithm on users' content preferences and engagement behavior over time. While personalization increases the relevance and engagement value of content, it could also have negative effects on content diversity and user autonomy. This research will explore whether Instagram's algorithm is simply a reflection of users' interests or if it has a more active role in shaping them. It will examine the correlation between perceived personalization, awareness of algorithmic impact, dependency, and behavioral outcomes. The research will also include digital literacy and usage intensity as control variables. By exploring both user perceptions and behavioral data, this research will help to understand the impact of algorithmic systems on engagement behavior in social media contexts. The results of this research will help to shed light on digital marketing practices, user behaviour and the overall effect of personalization on consumer choice in digital platforms.

Design/methodology/approach

A mixed-methods approach was adopted. Firstly, qualitative interviews were carried out with digital marketing experts. Secondly, a survey was conducted with 354 active Instagram users. The results were analyzed through reliability analysis, exploratory factor analysis, and regression analysis in SPSS to explore the relationships between the key variables.

Findings

The findings indicate that perceived personalization is a strong predictor of awareness of algorithmic impact. Awareness of the algorithmic impact has a significant effect on dependency on the platform and influences user behavior. The algorithm promotes repeated interactions with similar content, which has a gradual impact on preferences and behavior. Usage intensity amplifies behavioral effects and digital literacy has a slight positive effect on awareness and perceived control.

Research limitations/implications

The study uses cross-sectional survey data, limiting causal conclusions and generalization to other social media platforms.

Practical implications

The results imply that marketers should emphasize brand identity and authentic content over just following the trends of the algorithm. A comprehension of how feedback loops in the algorithm can help brands stay visible while still being original.

Social implications

The report is a cause for concern regarding decreased content diversity, dependency on platforms, and a lack of autonomy for users. Enhancing digital literacy and promoting transparency in algorithmic systems can assist users in making more informed choices about their engagement with social media content.

Originality/value

This study combines qualitative and quantitative evidence to show that Instagram's algorithm actively shapes user behaviour, extending existing research on personalization and selective exposure in social media marketing.

Keywords: Instagram algorithm; Personalization; User engagement; Platform dependency; Digital literacy; Social media marketing; Behavioural change

1. Introduction

In today's digital age, social media platforms rely on advanced algorithms to determine the content users encounter. These systems tailor the online experience to individual preferences, yet they also have considerable influence over shaping users' interests and actions. Instagram, being a major visual platform, exemplifies this phenomenon. Its algorithm not only suggests content but also plays an active role in shaping a user's online environment, affecting both what they view and how they engage with it.

According to the creators of the Instagram algorithm, it was designed so that if users engage with or interact with the content that has been produced, they will have greater exposure to content that is similar to theirs through the process of interaction (like, comment, share). This creates a cycle that allows the algorithm to learn from user interactions to determine what content to show them, which results in additional user interaction with that type of content. It is possible that this continual process of user interaction and algorithmic selection can result in "filter bubbles," i.e., being provided with content primarily representing a user's current views, with little opportunity to be exposed to other types of viewpoints (Leysen and coworkers, 2024). Over time, the cumulative result of this cyclical process can not only reflect a user's current preferences but can also influence what users choose to view in the future, thus creating an environment where users' choices are continuously relying on, and shaped by, the algorithmic suggestions (this has been referred to by researchers as "algorithmic precarity") (Hunnego et al., 2023).

The current available literature continues to show an absence of information regarding the specific ways in which users have adapted their behaviors to the algorithm and how this occurs over time; Liu (2024) noted that there was still a lack of understanding of the direct and causal effects of the algorithm's output on user behavior over time. While much has been learned regarding the workings of the algorithm and the outcomes that can be expected, minimal research has been conducted to understand the process through which ongoing algorithmic exposure has the effect of altering users' content preferences and engagement habits. Understanding this process is important for improving digital literacy and developing more transparent systems related to platform design (Garg, 2025). The research focuses on identifying the relationships between these two variables in order to fill the gap existing in the literature. The investigation of this research effort will evaluate Instagram as a medium to evaluate the active role of the Instagram algorithm and its relationship with user behavior. Within the context of algorithmic precarity (Hunnego et al., 2023), this investigation will respond to the research question being considered: How have personal interests and algorithms combined to shape a user's evolving content preferences and engagement patterns on Instagram?

2. Literature Review

Digital marketers now rely on Instagram to deliver messages. The way people receive messages has changed greatly because of Instagram. Users now choose who they follow based on their visual affinity with brands. Users and brands interact differently on Instagram than they would on other channels, due to Instagram's emphasis on displaying aesthetically appealing images and telling stories about the lifestyle appeal of products/services offered (Rahman et al., 2022; Singh & Sahu, 2024). Numerous studies indicate that the use of dynamic content (videos and images of people) on Instagram generates more engagement than static images (Rahman et al., 2022) and that influencer partnerships increase that type of engagement (Atiq et al., 2022). Authentic content and meaningful interactions have historically created trust with consumers, which will lead to continued engagement over time (Singh & Sahu, 2024; Thorgren et al., 2024).

According to Kumar and Singh (2024), the user experience of Instagram has been built off of the way Instagram has a system for curating what users will see and when (Kumar & Singh, 2024). Bharanitharan et al. (2024) found that when compared to Facebook, Instagram's algorithm encourages its users to communicate more often and with less of a delay than Facebook's algorithm; Facebook encourages users to communicate with their users in ways similar to each other, such as through likes and comments; Instagram encourages its users to communicate with one another through quick ways such as likes, comments, and direct messages; with that being said, users are allowed to engage with the Instagram community by engaging with the content of other users, and this type of engagement does not promote long-term friendships (Rahman et al., 2022). Branding is greatly improved with a content strategy, including a consistent post schedule, the use of effective hashtags, and following trends (Kumar and Singh, 2024).

Instagram has implemented personalization within its algorithm framework to boost user experience by filtering out unwanted or uninteresting material and then displaying this removed material to users according to their unique engagement history (i.e., what they like, comment upon, share, etc.) on Instagram (Bansal & Arora, 2022). Studies have shown that personalized content provided to users that aligns with

their areas of interest is associated with higher user interactions and retention (Patel & Sharma, 2024). Furthermore, although technical filtering is an important component of personalization, human-related factors such as digital literacy, psychological tendencies, and social motivations can influence users' responses to the algorithmic recommendations (Karizat et al., 2022). Therefore, while personalization helps create ease of access to relevant content, in addition, personalization reinforces selective exposure to information and/or content for the user and consequently may deny the user exposure to other diverse viewpoints, while also potentially limiting the scope/quantity of information the user will be able to access (Flaxman et al., 2016).

While the algorithm that Instagram developed can enhance both user participation and satisfaction with their accounts, at the same time, there are significant negative effects that result from that process. Research conducted by Uhls et al. (2025) demonstrated that users of Instagram, particularly young people, can exhibit cognitive fatigue due to recurrent exposure to algorithm-generated content, which can reduce their ability to concentrate for prolonged periods. When users receive many different pieces of content that provide rewards based on dopamine-induced cycles, Khan and Rani (2024) suggested that users may become addicted to using Instagram due to excessive screen time and compulsion. Due to a lack of exposure to differing viewpoints in this manner, users may lose the ability to develop independent thought when selecting which pieces of content they would like to view (Hunnego et al., 2023).

Beyond the manner in which users become exposed to pieces of content, the ways in which that content is represented also change because of what type of media is the most popular with users. Thorgren et al. (2024) found that users engaged with video posts, which use "album style" (more than one video or photo), for much longer than they do when engaging with one video/photo at a time. The manner in which an album-style post can have the greatest impact on user engagement is significant, as the way that this algorithm prioritizes the types of media being posted affects how people will see those kinds of media.

As Gurung et al. (2025) also noted, many highly engaging posts are shared due to the symbolic, cultural, or emotional importance that they convey or connect with, especially when related to social or political issues. Thus, by observing which content is most popular, both the creator of the content and the user of that content begin to compare and contrast similar themes and topics with one another, and as a result, a reinforcing loop forms, where both the creator and the user become conditioned to develop their content more in line with what is deemed to be successful by the algorithm versus their own personal interests (Flaxman et al., 2016).

User activity on Instagram is the result of a combination of both organic user actions and algorithmic influence. Engagement with content is affected by storytelling and relatability, which connect the type of content with the user audience they are engaged with in general (Atiq et al., 2022), as well as by the long-term viability of authenticity in promoting user engagement via an authentic and quality content approach (Singh & Sahu, 2024). User engagement behaviors can also be significantly affected by other elements, such as the timing and frequency of posted content, as these variables are influenced by algorithms, too (Aljumah, 2023). These factors suggest that user engagement activities are guided by emotional connections created organically with the content being produced and delivered, in addition to being supported by algorithmically replicated systematic behavior toward accumulating the highest levels of engagement between users and content providers.

The literature identifies Instagram's algorithms as providing two distinct functions: improved personalization/streamlined discovery of content and increased engagement; however, there are drawbacks to these functions, such as decreased diversity of content and reinforcing the behavioral traits of users while simultaneously obscuring the distinction between the authentic nature of users' preferences and the algorithmically determined preferences of users (Karizat et al., 2022). In conclusion, personalization results from both algorithmically designed functions and decision-making by the user and creates both empowering and constraining experiences for the user (Karizat et al., 2022). Ultimately, this qualitative study will examine how Instagram's algorithmic systems have changed users' content preferences, available autonomy, and engagement authenticity in relation to the ongoing evolution of the digital world within Instagram.

3. Theoretical Framework

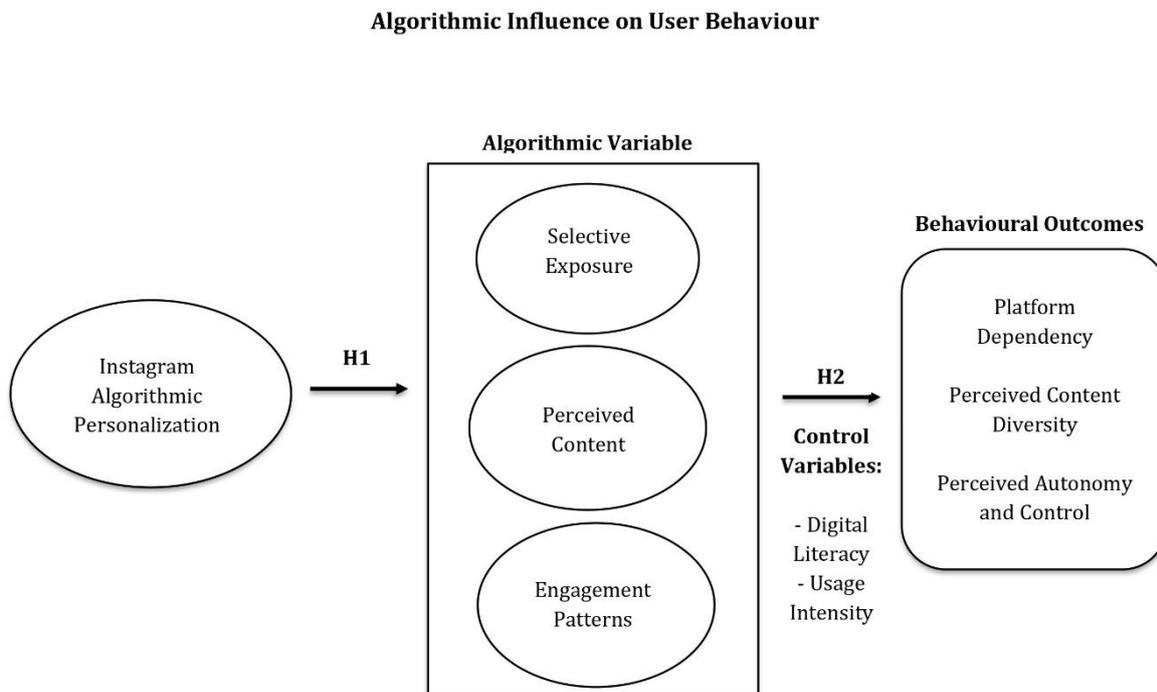


Figure 1. Theoretical framework of the study

This study is based on the idea that the Instagram algorithm is more than a reflection of the audience's interests because it actually affects how the audience engages with the content. The theoretical perspective describes the link between the Instagram algorithmic personalization and the audience behavior by pointing out the essential variables.

The independent variable in this research is Instagram Algorithmic Personalization. This is the algorithm used at Instagram to show people content in accordance with their past behavior on Instagram, including

likes, comments, shares, searches, and time spent on content. Through the algorithm that favors certain content at the front of users' feeds and explore pages, the algorithm determines what content users see and how often they view the content.

The impact of personalization by algorithms relies on three variables that are determined by algorithms, which are selective exposure, personal preferences, and levels of engagement. Selective exposure takes place if a user is consistently exposed to similar information that they have shown interest in sometime in the past. Over time, this gives users the impression that the content shown to them has a lot of correlation to their personal interests. It forms content preferences and may be influenced somewhat by the algorithm. It also affects the pattern of engagement of users and leads to habitual behavior such as scrolling and engaging with similar content types.

These algorithmic variables together impact the dependent variables, which outline the behavioral effects of algorithmic impact. Firstly, it includes dependency on platforms, wherein users increasingly depend on Instagram for entertainment, information, or socializing. Secondly, it includes perceived diversity of content, wherein users perceive the diversity or repetitiveness of the content they are accessing, which, at times, is decreased by the impact of algorithms. Thirdly, it includes perceived autonomy and control, wherein users perceive that their behavior is influenced more by algorithms rather than their own will.

To maintain balanced analysis, control variables like digital literacy and usage intensity have been used in the framework, which help in understanding how algorithmic recommendations affect or influence users.

This framework shows how the algorithm on Instagram is directly implicated in determining the user's level of engagement, preferences, and even exposure on the platform.

4. Exploratory Research

Purpose of The Exploratory Research

As part of the overall research design, an exploratory qualitative study was conducted to understand how digital marketing professionals perceive Instagram's algorithm and its influence on content visibility, user engagement, and brand communication. The objective of this exploratory phase was to gain practical insights that support the theoretical framework and complement the quantitative analysis. Given the evolving and algorithm-driven nature of Instagram, this phase aimed to provide contextual understanding rather than statistically generalizable results.

Research Design and Data Collection

The exploratory research involved qualitative interviews with digital marketing professionals who actively plan and manage Instagram-based campaigns. A purposive sampling method was adopted to ensure that participants had relevant industry experience and practical exposure to Instagram's algorithmic environment. The discussions focused on key themes such as algorithm functioning, engagement behaviour, content visibility, branding strategies, and platform dependence. The findings were thematically analysed and interpreted in conjunction with existing academic literature.

Findings

Algorithm as a Behaviour-Driven System

Participants consistently perceived Instagram's algorithm as being driven by user behaviour. Actions such as liking, saving, rewatching, and repeated interaction were viewed as key signals that influence what content is shown to users. Content visibility was therefore seen as a result of ongoing engagement patterns rather than one-time content quality. This perception aligns with prior studies that describe Instagram's algorithm as a learning system that adapts based on continuous user engagement, reinforcing similar content exposure over time (Flaxman et al., 2016; Patel & Sharma, 2024).

Influence on Engagement and Content Preferences

The exploratory findings suggest that algorithmic recommendations influence what users choose to like, follow, and engage with. Participants noted that repeated exposure to specific formats and styles increases familiarity, which gradually shapes content preferences and engagement behaviour. This observation supports existing research on algorithmic personalization and selective exposure, which explains how repeated recommendations can influence user preferences and engagement patterns (Hunnego et al., 2023; Karizat et al., 2022).

Feedback Loops and Trend Amplification

Participants highlighted that Instagram's algorithm creates feedback loops, where content that gains initial visibility is further amplified through repeated recommendations. Brands often respond to this by aligning content with trending formats or topics, particularly during moment marketing campaigns. Similar reinforcement mechanisms have been discussed in the literature, where both content creators and users adapt their behaviour based on algorithmically rewarded engagement signals (Flaxman et al., 2016; Gurung et al., 2025).

Importance of Instagram for Brand Visibility

Instagram was widely viewed as an important platform for brand visibility and engagement, especially for visually driven brands. Participants described the platform as a key discovery channel that enables organic brand exposure. However, they also reported challenges in consistently reaching the most relevant audience despite high visibility potential. These insights align with previous studies that highlight Instagram's role in brand discovery while also noting limitations related to audience targeting within algorithmic systems (Rahman et al., 2022; Kumar & Singh, 2024).

Content Repetition and Reduced Differentiation

Participants observed that Instagram frequently promotes similar types of content once a user engages with a particular style or theme. While this repetition can improve reach, it may also encourage imitation and reduce brand differentiation. This concern reflects existing literature that warns that algorithmic personalization can reduce content diversity and promote homogeneity across platforms (Karizat et al., 2022; Hunnego et al., 2023).

Limited Control and the Role of Digital Literacy

The findings indicate that users and brands have limited but indirect control over content visibility. While consistent posting, engagement, and clear messaging can influence reach, broader discovery remains largely controlled by the algorithm. Participants emphasized that understanding what the algorithm rewards—such as attention, consistency, and familiarity—is more valuable than focusing on frequent

algorithm updates. This aligns with prior research emphasizing the importance of digital literacy and conceptual understanding in navigating algorithm-driven platforms (Garg, 2025; Karizat et al., 2022).

Usage Intensity and Engagement Differences

Differences in engagement behaviour based on usage intensity were also noted. Heavy users were perceived to engage quickly and impulsively, while moderate users engaged less frequently but more deliberately. This suggests that usage intensity influences engagement style and attention patterns, supporting earlier studies that link social media usage intensity with differences in engagement behaviour (Uhls et al., 2025; Aljumah, 2023).

Authenticity within Algorithmic Constraints

Authenticity emerged as an important theme in the exploratory findings. Participants stressed the importance of maintaining consistent brand identity and content pillars rather than blindly following algorithm-driven trends. When a strong brand foundation exists, the algorithm was viewed mainly as a distribution mechanism rather than a creative driver. This perspective aligns with literature emphasizing authenticity and consistency as key factors for long-term engagement and trust on Instagram (Singh & Sahu, 2024; Thorgren et al., 2024).

Spss Analysis

Data Collection

For this study, approximately 1,500–2,000 individuals were contacted through email. These individuals were selected because they were active Instagram users, which matched the focus of the research. The email explained the purpose of the study and asked if they were willing to participate.

Out of the individuals contacted, 354 respondents agreed to take part in the study. The survey questionnaire link was sent only to these respondents. This ensured that participation was voluntary and that respondents were aware of the study before answering the questions.

All 354 responses received were complete and no missing values were found in the data. As a result, all responses were included in the analysis, giving a final sample size of 354 respondents. This sample size is considered sufficient for conducting reliability analysis, factor analysis and regression analysis in quantitative behavioural research.

Measurement of Variables

The study used a structured questionnaire to measure all the variables included in the research framework. Each concept in the study, such as personalization, algorithmic influence, digital literacy, usage intensity and behavioural outcomes, was measured using multiple statements. Using more than one statement for each variable helped capture the concept clearly and reduced the chances of measurement error.

All questions were measured using a five-point Likert scale, where: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

The Likert scale was chosen because it is widely used in social science research to measure opinions, perceptions and behavioural tendencies. It allows respondents to express the extent to which they agree or disagree with each statement, making it suitable for studying user perceptions and behaviour related to

Instagram’s algorithm. The same scale was used for all variables to maintain consistency. This uniform measurement approach made it easier to perform reliability testing, factor analysis, and regression analysis.

Reliability of The Instrument

The reliability of the questionnaire was assessed using Cronbach’s alpha, which measures the internal consistency of the items. Internal consistency shows whether the questions used to measure a variable are producing similar and stable responses.

In social science research, a Cronbach’s alpha value above 0.70 is considered acceptable, indicating that the measurement instrument is reliable.

In this study, the reliability test produced a Cronbach’s alpha value of 0.943. This value is well above the acceptable threshold, indicating a very high level of reliability. It shows that the items used in the questionnaire are consistent and measure the intended constructs effectively. Therefore, the questionnaire was found to be reliable and suitable for further statistical analysis, including factor analysis and regression analysis.

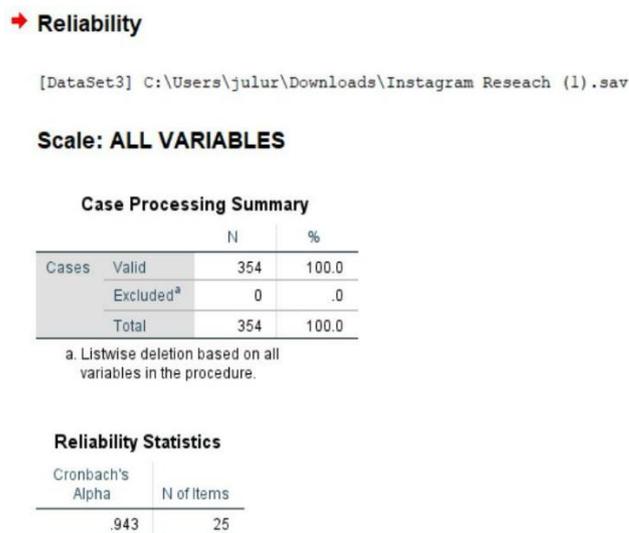


Figure 2. Reliability Statistics

5. Factor Analysis

An exploratory factor analysis (EFA) was conducted to identify the underlying structure of the measurement items and to ensure that the items were grouped correctly under their respective variables. Factor analysis is important when dealing with perceptions and behavioural concepts, as these cannot be measured directly.

The analysis was performed using the principal component method for factor extraction. This method helps reduce a large number of items into a smaller number of meaningful factors while retaining most of the information from the data. To improve clarity and interpretation, varimax rotation was applied.

Varimax rotation helps ensure that each item loads strongly on one factor and has minimal loading on other factors, making the results easier to interpret.

The results of the factor analysis showed that the items grouped clearly into their respective constructs, such as personalization, algorithmic variable, platform dependency and behavioural outcomes. This indicates that the items were measuring the intended concepts and that the factor structure was meaningful and consistent with the conceptual framework of the study. Overall, the factor analysis confirmed the validity of the measurement model and provided a strong foundation for conducting regression analysis.

6. Regression Analysis

This section explains the relationships between the main variables used in the study. The purpose is to understand which factors influence others, and whether the influence is strong or weak. To explain the results clearly, the interpretation mainly looks at the unstandardized beta value (B), the t-value, and the p-value (significance). When the p-value is less than 0.05, it means the variable has a meaningful influence. When the p-value is greater than 0.05, it means there is no influence.

Personalization and Algorithmic Variable-

The findings show that personalization strongly influences the algorithmic variable. In simple terms, when users feel that Instagram shows them content based on their interests, likes, views, or searches, they become more aware that the platform is working through an algorithm. The results support this clearly. The unstandardized beta value for personalization is $B = 0.651$, which means that if personalization increases by one unit, the algorithmic variable increases by 0.651 units. The effect is statistically significant ($t = 14.629$, $p < 0.001$). This shows that personalization is one of the main reasons people feel that Instagram's algorithm is active and influencing what they see.

Algorithmic Variable and Platform Dependency-

The algorithmic variable also shows a significant influence on platform dependency. Platform dependency refers to how much people rely on Instagram, how frequently they feel the need to check it, and how strongly it becomes part of their daily routine. The results show that the algorithmic variable increases platform dependency. The unstandardized beta value is $B = 0.582$, meaning that when perception of algorithmic influence increases by one unit, platform dependency increases by 0.582 units. This relationship is also statistically significant ($t = 10.663$, $p < 0.001$). This indicates that algorithms can make users more dependent on the platform by continuously showing content that keeps them interested and engaged.

Algorithmic Variable and Behavioural Outcomes-

The next relationship shows that the algorithmic variable has a strong influence on behavioural outcomes. Behavioural outcomes refer to changes in user behaviour, such as stronger engagement, repeated interaction with similar types of content, and changes in preferences over time. The results show that algorithmic influence leads to noticeable behavioural change. The unstandardized beta value is $B = 0.499$, which means that when algorithmic influence increases by one unit, behavioural outcomes increase by 0.499 units. This effect is statistically significant ($t = 13.763$, $p < 0.001$). This confirms that algorithms do not just show content randomly, they shape what users interact with and how their behaviour develops.

Personalization and Usage Intensity together predicting Algorithmic Variable-

When personalization and usage intensity are included together to predict the algorithmic variable, the results show a very clear pattern. Personalization continues to have a strong influence on the algorithmic variable ($B = 0.644, p < 0.001$). However, usage intensity shows no influence on the algorithmic variable ($B = 0.025, p = 0.656$).

This means that spending more time on Instagram does not automatically make users more aware of the algorithm. Users may use Instagram frequently, but that alone does not increase their perception of algorithmic functioning. Instead, people recognize the algorithm mainly when they notice personalized content, like seeing repeated recommendations, similar reels, or posts related to their past activity.

So, personalization is the key factor, and usage intensity does not matter in this particular relationship. Personalization and Digital Literacy together predicting Algorithmic Variable When personalization and digital literacy are included together, personalization still remains the strongest influence. Digital literacy refers to how well users understand digital platforms and how aware they are of how online systems work.

The results show: Personalization has a strong influence ($B = 0.602, p < 0.001$). Digital literacy has a small but significant influence ($B = 0.132, p = 0.041$)

This means that users who are more digitally literate are slightly more aware of algorithms, but the effect is not as strong as personalization. The main reason people sense algorithms is still because of personalized content experiences, not only because they understand technology better.

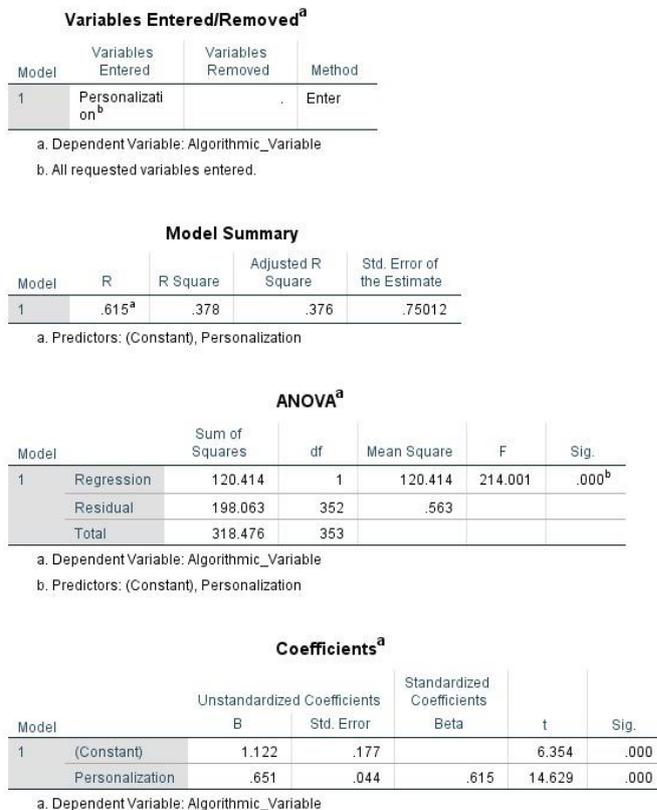


Figure 3. Regression Analysis Examining the Effect of Personalization on the Algorithmic Variable

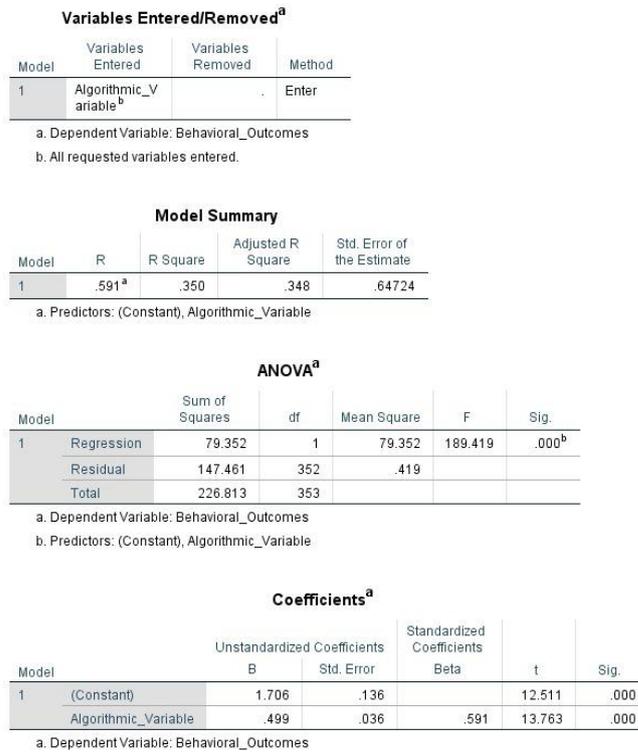


Figure 4. Regression Analysis Examining the Influence of Algorithmic Variables on Behavioural Outcomes

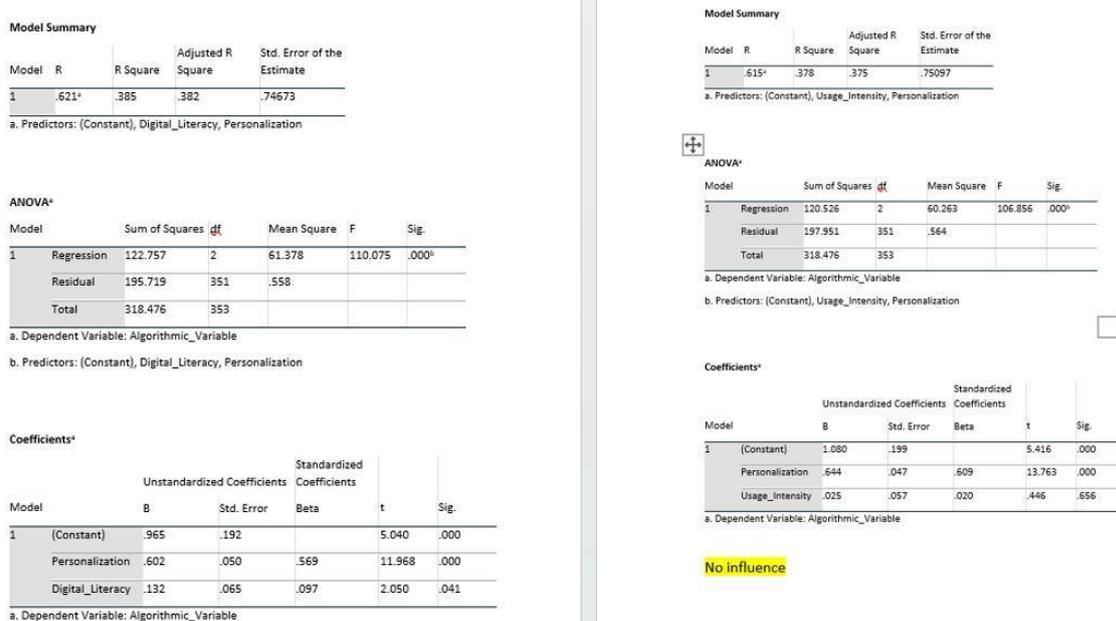


Figure 5. Regression Analysis of Personalization, Digital Literacy, and Usage Intensity on Algorithmic Variable

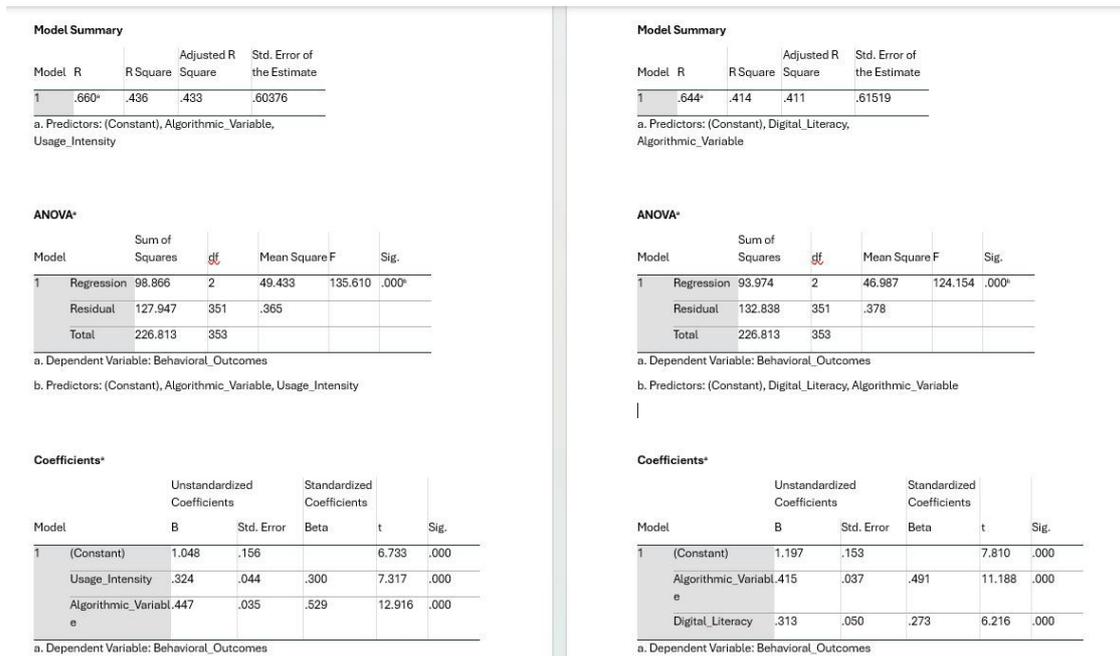


Figure 6. Regression Analysis of Algorithmic Variable, Usage Intensity, and Digital Literacy on Behavioural Outcomes

7. Analysis of Control Variables

To examine the role of control variables, linear regression analysis was conducted. The control variables included in the study were usage intensity and digital literacy. These variables were added to the regression models to understand whether user-related factors influence the algorithmic variable and behavioural outcomes, while keeping the main framework relationships intact.

Usage Intensity as a Control Variable

When usage intensity was included along with personalization to predict the algorithmic variable, the ANOVA results indicated that the regression model was statistically significant ($F = 106.856$, $p < .001$). This shows that the overall model provided a good fit for the data.

However, the regression coefficients show that usage intensity had no influence on the algorithmic variable ($\beta = 0.020$, $p = .656$). This indicates that the amount of time users spend on Instagram does not affect selective exposure, perceived content preferences, or engagement patterns created by the algorithm. Algorithmic influence appears to operate independently of usage intensity.

When usage intensity was included along with the algorithmic variable to predict behavioural outcomes, the ANOVA results again confirmed that the model was statistically significant ($F = 135.610$, $p < .001$).

The coefficient results show that usage intensity had a clear influence on behavioural outcomes ($\beta = 0.300$, $p < .001$). This suggests that users who spend more time on Instagram are more likely to experience stronger behavioural effects, such as increased platform dependency. While usage intensity does not influence the algorithmic process, it influences user behaviour.

Digital Literacy as a Control Variable

When digital literacy and personalization were entered as predictors of the algorithmic variable, the ANOVA results showed that the regression model was statistically significant ($F = 110.075$, $p < .001$), indicating a good overall model fit.

The coefficient analysis shows that digital literacy had a small influence on the algorithmic variable ($\beta = 0.097$, $p = .041$). This suggests that users with higher digital literacy may slightly differ in how they perceive algorithm-driven content, although personalization remains the dominant factor.

Digital literacy was also examined as a predictor of behavioural outcomes along with the algorithmic variable. The ANOVA results confirmed that the model was statistically significant ($F = 124.154$, $p < .001$).

The regression coefficients indicate that digital literacy had a clear influence on behavioural outcomes ($\beta = 0.273$, $p < .001$). This shows that digitally literate users are more aware of content diversity and perceived autonomy and control when interacting with algorithm-driven content.

8. Discussion

The results of this study demonstrate that Instagram's algorithm plays an active role in shaping user engagement behaviour rather than merely reflecting pre-existing preferences. The strong influence of personalization on perceived algorithmic functioning indicates that users primarily recognize algorithmic presence through repeated exposure to similar content types and themes. This finding supports the concept of selective exposure, wherein algorithmic systems gradually reinforce particular interests, thereby shaping content preferences over time. As a result, users may experience difficulty distinguishing between organically developed interests and algorithmically influenced preferences.

The regression analysis further indicates that perceived algorithmic influence significantly increases platform dependency. This suggests that algorithmic personalization contributes to habitual engagement patterns, where users rely on Instagram as a primary source of entertainment and information. While such dependency enhances engagement metrics, it also raises concerns regarding reduced content diversity and diminished user autonomy. These findings align with the theoretical perspective of algorithmic precarity, which argues that algorithm-driven environments subtly constrain individual choice by prioritizing familiarity over novelty.

Insights from the exploratory qualitative phase highlight how algorithmic feedback loops influence both users and content creators. Once content gains initial visibility, it is repeatedly amplified, encouraging creators and brands to conform to formats that the algorithm appears to reward. This adaptive behaviour reinforces homogeneity in content styles and themes, potentially limiting creative diversity on the platform. However, participants also emphasized that authenticity and consistent brand identity help mitigate overreliance on algorithmic trends, allowing creators to maintain meaningful engagement.

The role of control variables further clarifies these relationships. Usage intensity does not shape perceptions of algorithmic influence but intensifies behavioural outcomes, indicating that prolonged exposure amplifies algorithm-driven effects. Digital literacy contributes modestly to algorithm awareness and perceived autonomy, suggesting that informed users may be better equipped to critically interpret

algorithmic recommendations. Overall, the findings position Instagram's algorithm as a dual-force mechanism that enhances engagement while simultaneously shaping behavioural patterns and limiting perceived autonomy.

9. Implications

The findings of this study have several important implications for theory, practice, and users. From a theoretical standpoint, the study contributes to social media and digital behaviour literature by empirically validating the role of algorithmic personalization in shaping long-term engagement patterns and platform dependency. By integrating behavioural outcomes and control variables within a unified framework, the research strengthens existing discussions on selective exposure and algorithmic influence in digital environments.

From a managerial perspective, the study provides actionable insights for digital marketers and content creators. Rather than focusing exclusively on short-term algorithmic trends, brands should prioritize consistent content strategies and authentic storytelling to sustain engagement. Overdependence on trending formats may increase reach temporarily but risks reducing brand differentiation and audience trust. Understanding algorithmic feedback loops can help marketers design content that balances visibility with originality and long-term brand equity.

For users and platform designers, the study highlights the importance of digital literacy in navigating algorithm-driven platforms. Increased awareness of algorithmic influence can empower users to make more conscious engagement choices and reduce passive consumption. The findings also suggest the need for greater transparency in algorithmic systems, which could support user autonomy and promote exposure to diverse content. Policymakers and platform developers may use these insights to inform discussions on ethical algorithm design and responsible personalization practices.

10. Limitations

Despite its contributions, the study has certain limitations. The reliance on self-reported survey data introduces the possibility of response bias and subjective interpretation of algorithmic influence. Additionally, the focus on Instagram users limits the generalizability of the findings to other social media platforms with different algorithmic structures. The cross-sectional nature of the study also restricts the ability to draw long-term causal conclusions regarding behavioural change. Furthermore, the study examines algorithmic influence through user perceptions rather than direct access to platform-level algorithmic data.

Future research could address these limitations by adopting longitudinal designs to examine how algorithmic influence evolves over time. Comparative studies across platforms such as TikTok, YouTube and Facebook could provide broader insights into algorithmic behaviour. Experimental approaches may help isolate specific algorithmic features and establish causal relationships. Additionally, future studies could explore psychological outcomes such as well-being, attention span, and identity formation within algorithm-driven digital environments to further understand the broader social implications of personalization systems.

11. Conclusion

This study set out to examine how Instagram's algorithmic personalization influences user content preferences and engagement patterns over time. The findings clearly indicate that Instagram's algorithm functions as an active behavioural agent rather than a neutral content delivery mechanism. Personalization emerged as the strongest factor shaping users' awareness of algorithmic influence, while perceived algorithmic functioning significantly affected platform dependency and behavioural outcomes. These results demonstrate that user engagement on Instagram is not solely driven by individual choice but is continuously shaped through algorithmic reinforcement and selective exposure.

The study also reveals that algorithmic feedback loops influence both users and content creators, encouraging adaptive behaviours that align with algorithmically rewarded content formats. While such mechanisms enhance engagement and visibility, they also contribute to content repetition and reduced diversity. The presence of platform dependency further highlights how prolonged exposure to personalized recommendations can subtly limit user autonomy. At the same time, the role of digital literacy suggests that informed users are better positioned to recognize and navigate algorithm-driven environments with greater awareness and control.

By integrating exploratory qualitative insights with quantitative evidence, this research provides a comprehensive understanding of the dynamic relationship between algorithmic systems and user behaviour. The findings contribute to ongoing academic discourse on algorithmic personalization and digital engagement, while offering practical insights for marketers, users, and platform designers. Overall, the study underscores the need for a balanced approach to algorithm-driven personalization, one that enhances user experience and engagement without compromising content diversity, autonomy, or authenticity in evolving digital ecosystems.

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