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A PREDICTIVE MODEL OF SOCIAL MEDIA ALGORITHM IMPACT ON GENERATION Z DECISION-MAKING

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Abstract: Born between 1997 and 2012, Generation Z is the first generation to have matured within the ecosystem of algorithmic social media platforms. This study extends the authors' previous research on personalized social media content bias among Romanian Generation Z users by developing a predictive model through advanced econometric analysis. Building upon questionnaire data collected from 189 Romanian university students aged 18-27, this research identifies and quantifies correlations between algorithmic exposure variables and decision-making outcomes. The study explores the predictive relationships between social media usage patterns, platform preferences, perceived algorithmic influence, and subsequent decision-making behaviors. The findings contribute to the growing body of literature on digital influence by providing quantitative, predictive insights into how algorithmic personalization specifically affects the decision-making processes of Generation Z.

Keywords: Generation Z, predictive model, algorithmic influence, social media algorithm, decision-making, econometric analysis.

1. INTRODUCTION

In today's digital world, Generation Z lives and breathes social media in a way that no previous generation ever has. These "digital natives" have never known a world without the internet and are highly skilled at navigating platforms such as Instagram, Facebook, TikTok, and others, according to [3] and [6]. The ecosystem of algorithmic social media platforms covers three interconnected components. First, some users generate behavioral data through interactions, preferences, and engagement patterns; second, platforms serve as intermediaries collecting user data and hosting content; and third, algorithms process user data to personalize content delivery, create recommendation systems, and optimize engagement.

Generation Z users know exactly how to create a perfect online image and often prefer anonymous accounts where they can personalize their content, as [11] argues. However, behind this technical familiarity lies a paradox. Even though they spend countless hours scrolling through content selected by algorithms that shape their worldview, many

young people do not truly understand what is happening behind the scenes. Social media algorithms are incredibly sophisticated in analyzing what users like, what they follow, and what they interact with. They create these personalized echo chambers that can limit their exposure to different points of view and discreetly push individuals toward more extreme positions as they mindlessly scroll through their feeds [21]. Each social media platform has its own approach to keeping users engaged. Facebook shows users posts and ads based on what they have clicked on before, who they interact with, and details such as their age and location. Instagram focuses on what makes people double-click and share, using those likes and shares to decide what to show you next. TikTok has mastered the art of scrolling, creating what researchers call the "flow state," a phenomenon that describes the feeling a person experiences when they look up and realize that an hour has passed while watching videos. The platform's addictive entertainment loop keeps users coming back for more, according to [25].

In Romania, Generation Z's use of social media is in line with global trends, favoring Facebook, Instagram, and TikTok, as shown in [20]. This makes Romania an attractive place to observe how young people interact with social media algorithms, which seem to know exactly what users want to see. A recent study by [24] found that young Romanians mainly use Instagram (87%), YouTube (80%), and TikTok (56%). Almost 63% of respondents spend more than 2 hours a day on social media, highlighting the integral role these platforms play in their daily lives. The importance of understanding the influence of algorithms on Generation Z's decision-making process goes far beyond research interest. In 2024, the number of active social media users worldwide exceeded 5 billion, and forecasts indicate an increase to over 6 billion by 2028. Within this integrated digital system, Generation Z represents the most active demographic segment, with 93-97% of teenagers aged 13 to 17 using at least one form of social media platform. This study examines algorithmic influence on three primary categories of Generation Z decision-making: (1) informational decisions (source selection, fact verification, news consumption), (2) social decisions (content sharing, opinion formation, social interactions), and (3) consumer decisions (product preferences, brand choices, lifestyle adoptions). The research specifically focuses on the information-gathering and option-evaluation stages of the decision-making process, as these are most directly influenced by algorithmic content curation.

The first part of the study involved conducting a questionnaire with 37 items organized into five sections as follows: demographic information, psychographic and cognitive traits, social media platform usage patterns, algorithmic influence awareness and susceptibility, and active content engagement behaviors. The questionnaire results were analyzed using econometric methods, which made it possible to assess the three research hypotheses formulated in Section 3 of this article.

This research contributes to the field through the development of a combination of measures specifically designed to assess algorithmic influence on decision-making stages and through the application of sequential econometric modeling to test mediation effects in digital

psychology research, with a focus on Romanian Generation Z.

2. LITERATURE REVIEW

Social media algorithms exert a powerful influence on Generation Z, and researchers are trying to determine how these invisible forces shape young people's thoughts and actions. Thus, many authors have written about this in the literature, and there is a variety of research on the effects of social media, revealing a complex and sometimes contradictory picture.

The study by [10] shows that women tend to report more negative experiences with social media than men, which is probably due to how they use these platforms rather than any vulnerability. Also, when examining Generation Z, researchers were surprised to find that age was not a reliable indicator of susceptibility to social media algorithms. These findings challenge the common assumption that basic demographic factors can be used to predict a person's online experiences and behaviors [21].

Research shows that analyzing only the time people spend on social media platforms does not say much about how easily users can be influenced by algorithms. According to [24], people often feel torn between the desire for personalized content and protecting their online privacy, which leads to unpredictable behavior that basic demographic studies cannot fully explain [8] and [11]. TikTok's influence varies significantly from region to region, and Romania is an interesting case study in this regard. Despite the app's global popularity, Romanian users seem to be less engaged with the platform than the international average, as shown in [16]. This suggests that local culture and economic conditions play a more important role in the adoption of social networks than age or other demographic factors might suggest. Technical familiarity with the technology does not mean that users understand how algorithms work or that they can resist their influence. The literature consistently shows that predictive demographic factors and simple usage patterns do not adequately explain the variability in algorithmic susceptibility [8], [10], and [21].

Other research suggests that to truly understand what makes people vulnerable to algorithms, we need to look beyond fixed traits. The key seems to be in how users actively engage with online content. The study by [5] found that algorithmic recommendations cause users to interact with content much more effectively than recommendations from other people. Interestingly, this held regardless of the age, gender, or other demographic factors of the users. The researchers' conclusions suggest that it is not who you are that determines how easily algorithms can influence you, but rather how you behave and interact online. [22] proposes a theoretical model of the "feedback loop," in which user interactions are not just a final step, but a factor that "amplifies" the influence of algorithms. This self-reinforcing circuit works as follows: (A) User characteristics influence (B) active engagement, which in turn influences (C) susceptibility to influence. This $A \rightarrow B \rightarrow C$ structure is the classic definition of a mediation effect.

[18] argue that when users like, comment on, or share content, they are essentially telling algorithms to show them more similar content. These simple interactions create a snowball effect—the more people interact with content, the more it is pushed towards other users' feeds. It seems that users' daily clicks and comments end up overfeeding these algorithms, making them even more powerful in shaping the content disseminated on social networks.

Unfortunately, algorithms create "filter bubbles" and "echo chambers," exposing users to information that largely matches their beliefs. This leads to ideological homogeneity and reduces critical thinking, as research shows [2], [7], and [13].

According to the study conducted by [24], representatives of Generation Z in Romania use Instagram (87%), YouTube (80%), and TikTok (56%) simultaneously, which, as confirmed by [19], may serve as an implicit diversification of sources. Even though 48% of citizens use social media as their main source of information, there is a clear trend towards the diversification of platforms (e.g., YouTube, Facebook, Instagram, X, and TikTok). Therefore, digital and algorithmic literacy are essential skills that underpin the

accurate critical evaluation of information and active investigation, thereby counteracting algorithmic bias [4], [15].

Research suggests that accessing information from multiple sources and using different platforms encourages critical thinking and provides a more complete and balanced view of reality, thus helping the new generation become more resilient to information [12], [23].

3. METHODOLOGY

This quantitative study examines how social media algorithms affect Generation Z's decision-making through a detailed survey approach. The focus was on Romanian Gen Z individuals (born 1997-2012) since they've grown up entirely immersed in algorithmic social media, making them perfect candidates for understanding how personalized content shapes decisions. Subsequent analysis indicated that most respondents were over 18 years of age and, therefore, considered primary decision-makers in their own lives, strengthening the validity of the self-reported decision-making measures.

Based on the literature analysis presented in Section 2, this study tests three main hypotheses:

H₁: Susceptibility to algorithmic influence amongst Generation Z users is not significantly predicted by basic demographic characteristics or platform usage patterns.

H₂: Active content engagement mediates the relationship between user characteristics and susceptibility to algorithmic influence.

H₃: Diversification of information sources serves as a standalone defense against algorithmic influence vulnerability for Generation Z users.

The study employs a structured decision-making framework examining how algorithms influence the information-gathering and option-evaluation phases of consumer, social, and informational decisions among Generation Z users. A total of 250 potential respondents were sent the survey. The final sample consisted of 189 respondents, 67% female and 33% male participants, aged 18-27. All respondents were Romanian university students from various academic fields, ensuring representativeness across disciplines and resulting in a response rate

of 75.6%. This sample size meets the minimum requirements for multiple regression analysis, providing adequate statistical power to detect medium effect sizes given the number of predictor variables employed in the study. The structured questionnaire was designed using Microsoft Office Forms and distributed online. The study incorporated validated scales where possible and created new measures for constructs specific to the assessment of algorithmic influence. The online format was chosen to reach the digitally native Generation Z population via their preferred communication channels.

Figure 1 shows the steps involved in designing the research methodology:

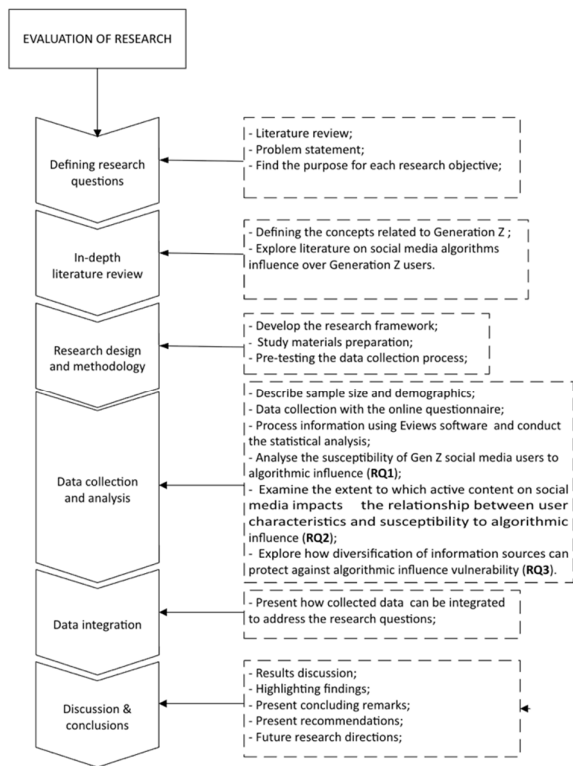


Fig. 1. Research methodology

The questionnaire used in the study measured the following key variables: one dependent variable, **INFL** (algorithmic influence), which was a composite measure assessing respondents' self-reported susceptibility to social media algorithm influence on their decision-making processes, was measured on a Likert-type scale. There were used also several independent variables, such as **VIDEO_PL** (video platform usage) measuring the

frequency and intensity of engagement with video-based social media platforms (YouTube, TikTok, and Instagram Reels); **GENDER** the biological sex coded as a binary variable (0 = Female, 1 = Male); **FRECV_DAY** (daily usage frequency) meaning the self-reported daily time spent on social media platforms; **ACTIVE_CONTENT** (active content engagement) measuring the level of active interaction with personalized content (likes, shares, comments, posts) and **V_INFO** (information source diversification), referring to the extent to which respondents seek information from diverse sources beyond what social media algorithms filter.

Statistical analysis was conducted using EViews econometric software, chosen for its robust capabilities in regression analysis, model comparison, and diagnostic testing. EViews provides comprehensive output for evaluating models and diagnosing issues, which is essential for econometric analysis. A sequential model-building approach was employed, progressing from basic to comprehensive specifications, to understand the relationships between variables and test specific theoretical hypotheses.

The model-building strategy involved the development of three sequential regression models to test the three different theoretical perspectives on algorithmic influence we formulated in the hypotheses presented in the previous section. The least squares method was used to interpret the results. The coefficient of determination R^2 is an important factor for prediction, since a high value means small prediction error, but to test a theory, the regression coefficient (β) is a measure of effect and the one that can assess a theory [14].

4. RESULTS AND DISCUSSION

The first regression model in the study is presented in equation (1):

$$INFL = \beta_0 + \beta_1 * (VIDEO_PL) + \beta_2 * (GENDER) + \beta_3 * (FRECV_DAY) + \varepsilon \quad (1)$$

The model in (1) examines the core relationships between basic demographic characteristics (gender), platform-specific usage patterns (video platforms), and general social media consumption frequency (daily usage) on susceptibility to

algorithmic influence. The results are presented in Table 1:

Table 1

Linear regression results – Model 1	
Variable	Model 1
Constant	1.509***
VIDEO_PL	-0.153026***
GENDER	0.213467**
FRECV_DAY	0.127120**
R_squared	0.128132
F-statistic	9.013719

Notes: *** p<0.01, ** p<0.05, * p<0.1

As shown in Table 1, variable **GENDER** with a regression coefficient $\beta_2 = 0.213467^{**}$ ($p = 0.0436$) reflects the fact that men have an algorithmic influence score that is 0.213 points higher than women. This means that Generation Z men seem to be more likely to let social media algorithms affect the choices they make. Gender may seem important, but it is just a proxy for more complicated online actions. With $\beta_1 = -0.153026^{***}$, results indicate that with each additional social media video platform, the susceptibility of Gen Z users to social media algorithmic influence is reduced. This may be considered a paradox, because other studies [3], [17], and [24] show that the popularity of video platforms such as TikTok is based on extremely tailored recommendation algorithms, which increase the exposure to filtered content, adapted to users' preferences.

The explanation for the results obtained in this study stems from the fact that the exposure of users of multiple social media video platforms was analyzed. Each of these platforms uses different algorithms, providing different perspectives on the content consumed by users, thus resulting in a reduced influence of personalized content on users. Watching videos across different platforms can sharpen users' critical thinking. When they are exposed to a wide range of visual content, they may start to notice patterns in how algorithms try to influence their viewing habits. Over time, people become better at spotting these tricks and making more conscious choices about what they watch. R^2 is 0.128132 (12.81%), which is consistent with other studies in digital psychology applied to Generation Z [1]. It falls within the 0.1-

0.4 range considered acceptable for the study of complex human behavior [14].

The second regression model in equation (2) adds another independent variable, **ACTIVE_CONTENT**, as presented above:

$$INFL = \beta_0 + \beta_1(VIDEO_PL) + \beta_2 * (ACTIVE_CONTENT) + \beta_3 * (GENDER) + \beta_4 * (FRECV_DAY) + \varepsilon \quad (2)$$

The results are presented in Table 2 as follows:

Table 2

Linear regression results – Model 2	
Variable	Model 2
Constant	1.542814***
VIDEO_PL	-0.149933***
ACTIVE_CONTENT	0.065783
GENDER	0.174512
FRECV_DAY	0.117940**
R_squared	0.137157
F-statistic	7.272385

Notes: *** p<0.01, ** p<0.05, * p<0.1

The active content acts as a partial mediator between gender and susceptibility to algorithmic influence. Coefficient $\beta_3 = 0.174512$, decreased from 0.213467 and became insignificant. Our findings suggest that the differences between men and women in how they respond to algorithmic recommendations are more closely tied to the content they typically engage with, rather than any inherent biological traits or social conditioning. In other words, gender doesn't directly affect how susceptible someone is to algorithms, but rather is the different types of content individuals of different genders tend to click on and interact with. With an $R^2 = 0.137$ (13.7%), the model captures the broad outlines of the phenomenon but fails to convey all the important nuances and details. With the data used in the study, which is only a snapshot of the moment, we cannot say with certainty what causes what. It is possible that things influence each other or that there are other factors that determine what we observe. Nonetheless, the protective effect of video platforms remains robust and consistent, confirming that this relationship is fundamental and not a statistical artifact.

Research shows that when users rely on algorithms to curate their online experiences, they often end up trapped in echo chambers or filter

bubbles [2], [7], [13], [24]. Instead of broadening their horizons, these systems tend to show more of what users already like and believe, reinforcing the already existing views while shutting out different perspectives. This feedback loop can make it harder to encounter new ideas or challenge one's own biases. Regression model three introduces the **V_INFO** variable, hypothesizing that when we expose ourselves to different perspectives, we begin to think more critically and analyze things from multiple angles. This helps individuals avoid prejudice and falling into the trap of seeing everything in only one way. It's like when you listen to multiple opinions on the same subject and realize that the truth lies somewhere in the middle. The regression equation in (3) introduces the perspective that exposure to diverse ideas develops cognitive flexibility.

$$INFL = \beta_0 + \beta_1(VIDEO_PL) + \beta_2 * (ACTIVE_CONTENT) + \beta_3 * (GENDER) + \beta_4 * (FRECV_DAY) + \beta_5 * (V_INFO) + \varepsilon \quad (3)$$

As presented in Table 3, our analysis revealed several noteworthy findings.

Table 3

Linear regression results – Model 3	
Variable	Model 3
Constant	1.827937***
VIDEO_PL	-0.146883***
ACTIVE_CONTENT	0.066252
GENDER	0.158140
FRECV_DAY	0.108195**
V_INFO	-0.128401*
R_squared	0.154395
F-statistic	6.646123***

Notes: *** p<0.01, ** p<0.05, * p<0.1

The model was highly significant overall (F-statistic = 6.646123***, p< 0.01) and explained about 15.44% of the variance ($R^2=0.154$), showing an improvement from the previous model. Information visualization emerged as a marginally significant protective factor ($\beta_5 = -0.128^*$, p = 0.0556), while video playlists continued to show the strongest protective effect ($\beta_1 = -0.146883^{***}$, p = 0.003). This model also had the best fit of the three we tested. An R^2 of 15.44% places the model among the relevant research in digital psychology. Interestingly, the gender effect we saw earlier completely disappeared ($\beta_3=0.158140$, p=0.145),

suggesting that these factors might better explain the observed patterns. Getting news and information from different sources helps protect young people from being overly influenced by algorithms and recommendation systems. When Gen Z actively seeks out diverse perspectives, they're much better equipped to think independently and avoid being manipulated by what their social media feeds show them.

Analyzing H_1 and H_2 , the first regression model revealed something surprising: people who spend more time on video platforms become less influenced by algorithms, not more, as many would expect, challenging what we typically assume about online vulnerability. Looking at gender differences, our second model showed that it's not being male or female that determines how susceptible someone is to algorithms, but rather the different ways men and women tend to engage with the content.

The third model confirmed what many digital literacy experts have mentioned: actively seeking out diverse information sources helps protect people from being overly influenced by algorithms. This validates current approaches to digital literacy education, as also presumed in H_3 .

In terms of practical implications, we can outline several working directions that can be addressed by educators and policymakers alike. Educators could encourage smart video platform use to build algorithm awareness and consider how different groups interact with content when designing lessons. Also, they should consider teaching students strategies for finding diverse information sources. In this regard, policymakers can consider offering support programs that teach people how to find and evaluate different information sources.

5. LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

This study has several limitations that support the development of the model. The study is limited to a specific group of young people, which may restrict its ability to be applied to the entire Generation Z population in Romania. Using questionnaires and relying on self-reported responses may introduce biases, such as the desire

to conform and the tendency to subjectively interpret one's use of social networks and interaction with algorithms. Objective behavioral data are absent. Failure to integrate actual usage data reduces the accuracy with which we can understand how algorithms influence user behavior. The statistical models used may not fully capture the dynamic, nonlinear relationships and feedback loops between user characteristics, active engagement, and algorithmic influence.

As this is a cross-sectional study, it is difficult to observe how the algorithm's influence and user behavior evolve. The cultural and socioeconomic context can significantly impact the relationships under study, yet these variables are not sufficiently integrated into the model. We can suggest some directions for further research:

1. Applying the research to larger samples, representative at the national or international level.
2. Integrating objective digital data for a more accurate understanding of the interaction of users with algorithms.
3. Applying machine learning techniques and non-linear models to capture the complexity of relationships and feedback effects.
4. Investigating how the influence of algorithms and user behavior evolves to identify long-term trends and effects.
5. Inclusion of cultural, social, and psychological variables.

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Un model predictiv al impactului algoritmilor de social media asupra procesului decizional al generației Z

Născută între 1997 și 2012, Generația Z este prima generație care a ajuns la maturitate în ecosistemul platformelor de social media algoritmice. Prezentul studiu extinde o cercetare anterioară a autorilor privind prejudecățile conținutului personalizat de pe rețelele sociale în rândul utilizatorilor români din Generația Z, prin dezvoltarea unui model predictiv folosind analiza econometrică avansată. Bazându-se pe datele din chestionare colectate de la 189 de studenți universitari români cu vârste cuprinse între 18-27 de ani, această cercetare identifică și cuantifică corelațiile dintre variabilele de expunere algoritmică și rezultatele procesului decizional. Studiul explorează relațiile predictive dintre modelele de utilizare a rețelelor sociale, preferințele platformelor, influența algoritmică percepută și comportamentele decizionale ulterioare. Concluziile contribuie la extinderea literaturii privind influența digitală, prin furnizarea de perspective predictive cantitative asupra modului în care personalizarea algoritmică afectează în mod specific procesele decizionale ale Generației Z.

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