

Examining the Causal Pathways: Digital Marketing Modalities and Their Effects on Contemporary Consumer Behavior

Yuming Song^{1,*}

¹Jinan Foreign Language School
International Center, Jinan, China

*Corresponding author: ineviming@gmail.com

Abstract:

Technological advancements in digital marketing technologies are transforming how consumers engage—moving away from traditional marketing approaches to data-driven, personalization strategies. The present study aims to examine the influence of novel digital marketing modalities including voice, short videos, AI recommendations, and emotional content design on today's consumer behavior from a causal chain perspective. This study discerns three principal pathways, cognitive priming, facilitated by personalized content; emotional activation, fostered by multimedia formats; and social influence, exerted by influencer networks and algorithmic filtering. It is worth mentioning that Artificial Intelligence (AI) based recommender systems are proved to decrease effort for decision making, but they raise privacy and over-personalization issues. Moreover, visual variations and emotional arousal in audio greatly improve engagement and brand recall. The paper concludes with a discussion of implications for managers regarding the use of causal mechanisms, a recommendation that marketers take a mechanism-aware view, targeting content based on user contexts while balancing personalization with issues of transparency and ethics. Lastly, future research directions including cross-cultural studies, longitudinal behaviors tracking and sustainable marketing framework building are suggested due to digital marketing becoming ever more complex in the era of AI.

Keywords: Digital marketing modalities; contemporary consumer behavior; artificial intelligence.

1. Introduction

Over the past decade, the digital revolution has ir-

revocably transformed how companies engage with consumers. By 2022, more than 82% of consumer internet traffic was predicted to be video content,

indicating a clear trend toward multimedia-rich communication [1]. Whereas only a few years ago, inferential analyses on large data sets were viewed as scientific curiosities rather than mainstream business practices, data-intensive and computational research has now become a norm across most disciplines in the natural and life sciences. With services such as TikTok blurring the lines between commerce and entertainment, there is growing demand for a more comprehensive understanding of the effects of these modalities on the cognition and action of consumers [2]. This study examines the causal mechanisms that underpin modern digital marketing technologies and emerging consumer behavior in the 21st century, namely, how specific developments—typed versus voice search, algorithmic personalization, emotional video content, and influencer networks—impact purchasing intent, engagement, and choice heuristics. Due to the growing number of companies channeling more than 50% of the marketing budget into digital tools, knowledge about the psychological and behavioral effects technology impose is no longer an option, it is technologically survival and an ethical issue [3]. Related work also sheds useful light on the impact of some of the components that constitute digital marketing on consumers. For example, requests using typed search modality are reported to have a higher purchase intention than the voice search deliveries due to the action-oriented mindset triggered by typing, described as an effect of the Hebbian learning mechanism [4]. On the contrary, voice-based recommendation systems, especially when conveyed by male agents, are reported to be more persuasive for search-based product types due to the perception of credibility and utility of the system [5]. These results suggest that interaction mode as opposed to content may influence consumer decision processes. The impact of emotional media and multimedia on short video sharing is another increasingly emerging concern. Moderate presenting audio arousal combined with the visual dynamic concept generates high consumer attention, whereas inconsistent or over-stimulating design decreases the message recall and causes mental saturation [6]. The subjectivity of video ads as well as product price are two major factors that contribute to both informative and persuasive effects on behavior [7]. These studies illuminate the emotional and cognitive significance of contemporary digital interaction. A highlighted area is in the field of algorithmic personalization. General Data Protection Regulation (GDPRs) enacted to mitigate privacy breaches coincide with surges in AI-driven personalized promotional recommendations (AI-PPRs) on content-sharing platforms like Douyin: whereas the former mitigate the privacy violations caused by the latter by controlling the triggering frequency and content cooperativity, their joint impact on user engagement and trust can become

mixed whenever user responses are likely to depend on the timing and content relevance of AI-PPRs, and the authenticity of the endorsers [2]. Although enabling efficient search and optimal satisfaction, such systems also face challenges in terms of user fatigue and/or ethical backlash due to aggressively being perceived as manipulative. These results draw attention to the double-edged nature of personalization as a satisfaction enhancing system and a potential vehicle for user suspicion. However, few studies have integrated the causal paths between multiple digital marketing modalities and their multi-stage influence on consumer behavior (from awareness, consideration, and decision making to action) in a systematic way. There has been little comprehensive work addressing all the three challenges above; most works are piecemeal; only dealing with modality comparison, content design or personalization. The influence of comprehensive marketing models on consumer behavior is in this paper. This approach is cross-disciplinary, bridging quantitative findings (e.g., predictive modelling of facial expressions and engagement with Convolutional Neural Networks (CNNs) with qualitative perspectives (e.g., interviews about user perception of AI-led recommendations) [2,8].

This study also combines models such as Attention, Interest, Desire, Action (AIDA) models to analyse the differential effect of digital content through different phases of the consumer journey [9]. The remainder of the paper is structured as follows. In section 2 this study describes the progress and key features of digital marketing modes, such as voice, video, AI, and interactive platforms. Chapter 3 looks at change in consumer psychology, decision-making amid automation, emotional resonance, and shorter attention spans. Section 4 discusses the mechanisms of impact-personalisation of content, modulation of senses, recommendation algorithms – and their managerial and ethical implications. Section 5 concludes with forward-looking research lines and strategic points of attention for marketers in the era of growing algorithmic power. By systematically investigating these features and the resulting behaviors, this paper hopes to better inform theory and provide practical guidelines to firms that wish to influence people in lawful and constructive ways in digital environment.

2. Defining Features and Technology Enablers of Digital Marketing

At the core of digital marketing remains dynamic technology drivers shaping the way people navigate and these have been reflected in some of its core characteristics as: personalization; interactivity; real-time adjustment; algorithmic automation; and multimedia integration. These characteristics are redefining the conventional customer

journey, and create new causal mechanisms with direct effects on customers in a subtle, multidimensional fashion.

2.1 Personalization and AI

Today's signature of digital marketing remains the delivery of personally relevant content at a mass scale. Much of this is thanks to the rapid progress in artificial intelligence, and more specifically in machine (or deep) learning. AI makes it possible for platforms to acquire, process, and analyze vast quantities of behavioral data in real-time, and to personalize marketing stimuli—from product recommendations to promotional bundles—for every single consumer. Some scholars offer a convincing illustration of this in their work, where they used CNNs to predict facial expressions that relate to consumer engagement [8]. What it shows is happiness and other positive emotions are very strongly predictive of purchase interest, and negative emotions such as fear or disgust signal disengagement. The capability to identify and act on emotional cues as they happen is one giant step forward for matching digital messages with psychological sensibility. AI-PPRs, the recommender system based on AI technology, has been turned for video-commerce platforms (Douyin in particular) not only to face recognition. These recommended systems can effectively improve user experience and keep relationship between commercial content and entertainment contents harmonious [10]. When timely and context-appropriate, these custom-tailored recommendations minimize search friction and heighten satisfaction. Yet if they are perceived as invasive or controlling, they trigger psychological reactance and privacy-invading concerns.

2.2 Multimedia, and Immersive Content Design

A second important feature of digital media is that of media integration, particularly multimedia such as video or sound. Video in marketing is growing exponentially because of its power to evoke emotions and its multi-sensory appeal. Some scholars introduced an explainable machine learning model which was trained to evaluate how content specific features in educational videos affect learner engagement [1]. This framework, though designed as a learning tool, serves as a useful metaphor for marketing: as in video, pacing, auditory and visual rhythm all influence user attention and conversion probability. Some scholars foreground this position by considering the attentional impact of both auditory emotional arousal and visual diversity for commercial short video marketing [6]. Their large-scale multimodal study suggests that a moderate level of arousal increases engagement in an inverted-U fashion – too little and the viewer will be disengaged, too much and cognitive overload will be the result. Even more interestingly, they detect a significant enhancement in engagement when auditory and visual cues are consistent,

thereby obviously indicate that multisensory compatibility should play a vital role in content strategy. The illuminative power and the persuasive power are two independent causal pathways that share common price levels and emotional tone [7]. For products of less price, persuasive tactics are more effective, whereas in the case of high involvement of low-price products, the informational content prevails [7]. These findings further underline the importance of fine-tuning emotional signals, price cues, and the framing of narrative in video advertising as a function of social context.

2.3 Search Mode and Interaction Interface

Content as a form of marketing has been researched and analysed to death. Now input modalities –how a content is consumed – has become a major marketing factor too. Users have more intention to buy if the queries are self-typed [4]. This is thought to be due to a goal-activation mechanism, by which typing brings about a more intentional, task-focused, thought process. On the other hand, voice input encourages passiveness and decreases perceived control, especially in product discovery situations. These findings have implications for companies developing omnichannel interfaces and virtual assistant interactions, indicating that search modality is not neutral, but behaviorally impactful. Similarly, voice assistants are not only technical devices, but psychological agents. Some scholars showed that voice recommendation, particularly from the male voice, for search-based products, in particular that voice recommendations for search-based products seemed more credible and useful than text-based recommendations. Their results extend media richness theory, suggesting that voice contains affective and relational cues that text alone does not. In other words, interface design is no longer only about function – it has become an aspect of trust, credibility, and decision making.

2.4 Algorithmic Governance and Ethical Complexity

As explained by some scholars, algorithmic-based viral marketing exploits influential users, network topology, and popularity dynamics to enhance content propagation [10]. This helps foster an environment in which user attention is swayed not just by content, but by how algorithms order, recommend and personalize it. Though it's a powerful move that amplifies reach and effectiveness, it also raises ethical challenges tied to personal data, biased algorithms, and psychological manipulation. In other words, digital marketing is not solely about convincing consumers anymore- it is about engineering attention and behavior based on real-time prediction.

3. Evolving Patterns in Consumer Behavior

The explosion of digital marketing tech has changed businesses and consumer behavior for good. The modern consumer is no longer passively exposed to marketing stimuli but instead is an active navigator of personalized, algorithm-constructed environments with growing demands for personal relevance, convenience and control. This section critically examines the changes in consumer behavior in the digital era, including algorithmic engagement, emotional processing, multimodal influence and the changes in both trust and decision heuristics.

3.1 The Algorithmic Attention and the “Push Economy”

Today’s digital spaces are characterized by pushing of information, most notably by algorithmic engines with predictive consumer behavior. At the same time, AI-PPR in platforms such as Douyin face the boundary between content exploration and consumption [2]. Those recommendations don’t merely lower the search cost for consumers, but they also fit smoothly into how consumers engage with entertainment-leading to frictionless consumption. This moves toward a “push” model of products seeking out (as opposed to the other way around) represents a significant shift in consumer power and behavior.

But over-personalization also creates novel psychological feedback. Users surveyed felt manipulated or monitored when personalization surpassed a perceptual threshold, which led to behaviors of privacy resistance like ad-skipping, uninstalling apps, or disengaging [2]. So, discreet curation has short-term benefits for enhancing user engagement but long-term risks in erosion of trust.

3.2 Attention, Emotion, and Short Video Trends

Consumers are molding to the shape of short form, high arousal content functioning off sensory and emotional triggers. Some scholars find that user engagement in response to short videos with a medium level of auditory emotional arousal and visual variation [6]. Their work showed that it was an inverse U-shape relation between auditory arousal and engagement.⁴⁵⁷ Too low arousal does not draw attention, and too high causes cognitive fatigue and leads to dropout.

Some scholars extended such results by separating the informative and persuasive effects of short videos [7]. Their work demonstrated that video tonality’s subjectivity, like whether it focuses on emotional appeal vs. product features, influences conversion differently for different product prices. Dealing with lower-price, hedonic goods: Emotional persuasion works; Dealing with high-involvement, utilitarian products: Information-laden content

prevails. These findings suggest that consumer response is contingent on context and that emotional, sensory, and semantic components need to be calibrated.

3.3 Searching, Interaction Modality, and Cognition

There are also behavioral changes in consumers’ use of search systems. Typed search modalities generate higher purchase intentions than voice search [4]. Their results are based on cognitive priming theory: when typing, people activate an active goal-directed mindset which may not be present while using voice assistants due to voice assistants being more passive exploration-type interactions. The suggestion being that the interface has an effect on a user’s mental state; and on what they end up buying.

Resistance to voice aids is examined as well as that of the use of voice-based virtual assistants; however, they found that for search products, recommendations delivered with a male voice were rated as more credible than those via either a female voice or text [5]. This variation is associated with media richness, and gendered norms of authority and trust. Consumers are nudged not only by what they are told, but by how and by whom the message is conveyed. Thus, interface voice persona-ignoring so far-can significantly affect consumer responsiveness.

3.4 Interplay of Emotions and Cognition in Video Learning and Marketing

Some scholars investigated user behavior in online video classrooms and observed that content related parameters such as visual cadence and percentage of speech are predictive of user retention and rewatch behavior [5]. Their machine learning system successfully predicted points of drop-out and high-engagement passages, which demonstrated the impact of document structure on cognitive load and attention span. Transposed into marketing terms, such a revelation means that tiny details – such as how often the scene changes, or the speaker’s tone – have an outsize effect on how viewers behave.

This is related to some scholars who investigated the heterogeneous effects of content components in digital sales promotion campaigns using the AIDA mode [4]. They found that semantic and context effects of attention interest and other consumer-decision variables differed across consumers. Now, rather than data combined with gut feelings and intuition, ads can be placed based on psychological precision.

3.5 Trust, Authenticity, and Skepticism in an Influencer World

Trust itself is changing. One of the other huge changes in consumer behavior is how trust works. It is the exposure

to the promoted content generated by algorithmic virality and influencer marketing that affects not just what content will be consumed by the consumers but have also a difference in how credible the content is perceived [10]. But consumers are becoming more and more wise to the ways of promotional trickery, especially when it comes to influencer content. As some scholars defined ‘users’ perceptions of influencers as too commercialized or scripted and the level of engagement is seriously reduced [2]. What they appreciate isn’t sanitized PR; it’s authenticity and relational trust. Raw content, even with spontaneous posts shared by micro-influencers or peer networks, generally gets more emotions and action than polished videos. This is a departure from brand-centric to user-centric trust models based on authenticity rather than status or reach.

4. Strategies for Leading Through Communication and Perception

Digital marketing today functions not just as a channel of communication but as a causal machine -an organized ensemble of algorithmic triggers, sensory stimuli and behavior-shaping nudges. This section examines the process of influence of digital marketing efforts on consumer behaviour, with a special focus on the managerial implications and current complex questions related to ethics, trust and regulatory limitations.

4.1 Influences Mediated Through Cognitive, Affective, and Social Mechanisms

Digital tools influence consumers along three main mechanisms: cognitive, emotional and social. Cognitively, recommendation simplifies complexity by reducing perceptions of choice overload and increases confidence in decision making. AI-PPRs enable user-oriented content recommendation, and thus improve user satisfaction by recommending content that is according to user preference, which is particularly important in short-video content recommendation [2]. These systems, by minimising cognitive effort, expedite decision-making, but at the expense of exploration and the risk of echo chambers.

From an emotional perspective, persuasiveness is mainly based on their power of inducing feelings that support attention or memorization. Some scholars have shown that moderate auditory stimulation and synchronized visual variation leads to increased engagement with consumers [6]. This is not a trivial effect as it derives from sensory integration theory, which suggests that much stronger encoding and decision recollection is achieved for cross-channel cues.

From a social standpoint, influencer marketing trades on prospective parasocial relations — whereby users view influencers as friends, rather than spokespeople. Networks,

particularly the real ones (eg., with real micro-influencers), spell out virality and public opinion [10]. And those processes are facilitated by algorithmic platforms that stand-up popular articles that are engineered to have a life cycle based on engagement, sentiment, dwell time.

4.2 Content Design: From Intuition to Optimization

The transition from intuitive content design to causal optimization is one of the most important managerial implications of the most recent research. Ullal et al. applied machine learning, in the AIDA framework, for the decomposition of vehicle promotion into the constituent components—headline structure, color scheme, pricing strategy-and estimation of their treatment effects on different population segments [9]. Their results illustrate that targeted is better when coupled with real-time analytics, which can inverse conversion rates and wasted impressions.

Furthermore, Alipour et al. who applied CNNs to real-time emotional feedback obtained through facial reactions of viewers [2]. Now, rather than serving up content in a static way, marketers can adapt dynamically: if an audience member looks confused or bored, they can be served something in a different format or tone-leading to hyper-personalized interaction loops. As a result, not only is campaign performance improved, but relevance at a consumer-perceived level is also increased.

4.3 Ethical and Psychological Challenges

Though algorithms improve efficiency, they also add ethical liabilities. Worries over fake news, filter bubbles, and micro-targeted manipulation are raised [10]. For example, amplifying emotions (i.e., to elicit high-arousal responses) in a design can take advantage of vulnerabilities, such as emotional burnout, decision fatigue, and weakened consumer autonomy, potentially causing the design to work against the users’ well-being .

Privacy concerns are also paramount. Some scholars reported that when personalization becomes “too accurate,” people feel uncomfortable, and end up avoiding the technology [2]. The gap between customization and perceived intervention indicates that ethical canons need to be actively implemented into marketing algorithms.

What’s more, the ascent of influencer marketing creates its own set of obstacles. Consumers are becoming more suspicious of influencers, especially when influencers are not transparent with promoting content. To keep them engaged, companies need to focus on authenticity, disclosure, „value-based storytelling,“ and moving away from transactional marketing to trust-based marketing.

5. Conclusion

Taking an interdisciplinary synthesis approach, the study draws on both behavioral theory and empirical machine learning work, and employs content analysis to investigate the cause-effect relationship of important contemporary digital marketing modalities—such as voice search, short videos, AI-enabled personalization and emotional content design—and their effects on changes in consumer behavior. This study specifies three main features: firstly, digital marketing boosts consumer decision-making through cognitive priming and effort-saving; secondly, emotional arousal and sensory synchronization in multimedia content raise user engagement; and thirdly, social signaling and algorithmic curation transform the way consumers form trust and interpret influence.

This study also adds further details about the fact that interfaces have turned into “agents” that foster certain kinds of behavior, instead of being merely conduits. That is found in mechanisms like input modality (type vs. voice) trigger different mental states, audiovisual congruence in short-form videos to boost memory retention and emotional resonance, and AI-driven recommendation engines which drop search costs yet may be opposed when over intrusive or manipulative.

In the following, this study propose three research directions in preparation. Firstly, cross-cultural empirical research is required to investigate the consumer reaction to personalized technologies and interfaces in different cultures. Second, future longitudinal behavioural tracking should investigate how prolonged exposure to algorithmic systems affects habits, attitudes and brand loyalty. Third, academics ought to focus on creating sustainable marketing frameworks that integrate AI systems not just for commercial purposes of marketing and selling but for promoting social good—such as fostering responsible consumption, enhancing public literacy and civic education, and encouraging morally upstanding digital behavior.

In other words, the great potential of digital marketing is not merely technological precision but its psycho-ethical precision. It’s only through this filter that brands can create the lasting relationships required in a more personal, immersive, and intelligent digital world.

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