

RESEARCH ARTICLE

From Attention to Avoidance: The Impact of Ad Fatigue on Consumer Buying Behavior

Zeeshan Aashiq ^a  Sohaib Uz Zaman ^b  Syed Hasnain Alam ^c 

Abstract: The purpose of this study is to explore the shift in digital advertising from attention to avoidance by analysing the interrelationships of key factors impacting consumer purchase behaviours: ad exposure, ad intrusiveness, ad irrelevance, and ad avoidance and fatigue as mediators. For this study, an experimental study was used with a quantitative research design and a structured survey method. This study employed a partial least-squares structural equation modeling (PLS-SEM) methodology, employing a questionnaire with a focus on the Likert scale to gather data from consumers, and the use of the software SmartPLS to examine data. Ad irrelevance ($\beta = 0.143$, $p = 0.151$) but neither ad exposure ($\beta = 0.379$, $p < 0.001$) nor ad intrusiveness ($\beta = 0.385$, $p < 0.001$) significantly explains ad fatigue. However, ad fatigue has a significant influence on digital avoidance ($\beta = 0.823$) and brand silencing ($\beta = 0.826$), which further affects consumer buying behavior significantly, such that digital avoidance has the highest impact ($\beta = 0.725$). It also tells about the model variance of 94.5% of the variance in the buying behavior. This study adds by combining ad fatigue, digital avoidance, and brand silencing into a single construct and indicating the ability of ad fatigue as a predominant mechanism between advertising stimuli and consumer behaviours.

Keywords: Ad Fatigue, Digital Advertising, Ad Exposure, Ad Intrusiveness, Digital Avoidance, Brand Silencing, Consumer Buying Behavior, PLS-SEM, Social Media Marketing

Introduction

Digital technologies have transformed how businesses market, and as of today, social media is one of the primary marketing channels. As the world becomes increasingly digital, the use of digital adverts is becoming more popular among businesses as they look for ways to reach their target audience, improve brand awareness, and influence buying decisions in a competitive market. Social Media platforms allow businesses to provide customized, interactive, and targeted ads, which boost engagement and communication efficiency (Li et al., 2023; Hazzam, 2022). However, as the digital advertising channel has become more mainstream, it has pushed advertisers to spend more of their budgets on this channel, meaning there is more competition vying for the consumers' attention and difficulties in maintaining engagement.

Media, in particular the digital segment, which has grown dramatically in the last 10 years due to the rise of technology and the penetration of the internet and smartphones worldwide, is in an exponential state of expansion and should be taken into account by any company that wants to leverage its advertising budget. Social media platforms like Facebook, Instagram, TikTok, and YouTube are key to advertising strategy and allow businesses to target large and diverse audiences with a degree of precision. These are built on user information and algorithmic systems for delivering tailored advertisements, boosting advertising effectiveness, and consumer interaction (Li et al., 2023; Pan et al., 2024). Consequently, digital advertising is one of the most powerful advertising media in today's business landscape.

^a Researcher, Karachi University Business School, University of Karachi, Sindh, Pakistan.

^b Assistant Professor, Karachi University Business School, University of Karachi, Sindh, Pakistan.

^c Researcher, Karachi University Business School, University of Karachi, Sindh, and Department of Business Administration, Emaan Institute of Management and Sciences, Karachi, Sindh, Pakistan.

With the proliferation of digital advertising, especially on social media, the amount, frequency, and personalization of ads have reached an unprecedented level, which is a challenge for maintaining consumer attention and engagement. Although digital advertising has been generally regarded as a powerful option for driving consumer purchasing choices, its overuse of repetitive, intrusive and irrelevant ads has led to a phenomenon known as 'ad fatigue' – a mental state that has its roots in message overload, cognitive fatigue and diminishing engagement with advertising content (Fernandes & Oliveira, 2024; Sharma et al., 2023; Bright et al., 2018). The trend that triggers consumers to become less interested and avoid advertisements is known as "consumer avoidance behaviour," whereby consumers actively avoid, ignore, or do not look at advertisements (Fernandes & Oliveira, 2024; Sharma et al., 2023).

Literature Review

Empirical Study

Advertising Exposure has become a key research area in the understanding of consumers' behaviour in the digital environment, as the frequency and extent of advertising messages are increasing with the rise of social media. Currently, advertising exposure is an important phenomenon that influences consumers' knowledge, attitude, and purchasing intentions in the digital era (Li et al., 2023; Sharma et al., 2023; Pan et al., 2024; Hazzam, 2022). Logically, on a modern digital landscape, one can see that advertisers are competing for more and more attention as the consumer is constantly being inundated with advertisements thanks to algorithm-driven content delivery systems. In the current marketing research literature, the relationship between exposure and behavioral outcomes is complex: in the case of persuasion, for instance, moderate exposure will lead to better brand recall and persuasion, but excessive exposure may result in diminishing returns. Advertising intrusiveness is also a pivotal construct, indicating how much the ad interrupts the consumer's cognitive process and online experience. Intrusive ads tend to disrupt user tasks and provoke negative feelings like annoyance, unease, or frustration (Bright et al., 2018; Li et al., 2023; Fernandes & Oliveira, 2024). Digital environments make intrusive even worse because of pop-up windows, autoplaying videos, and unwanted ad exposures, all of which take away the control and autonomy of each consumer in their cyberspace experience. The literature indicates that there is a reduction in engagement as well as resistance to advertising due to intrusive advertising; it is imperative, therefore, that it be taken into consideration when discussing consumers' reactions to digital marketing strategies.

Theoretical Foundation

Stimulus–Organism–Response (SOR) Theory

The Stimulus–Organism–Response (SOR) theory proposes that people think and feel in response to stimuli that are in the environment (S), which in turn affect their behavior (R). Stimuli involve various factors, including ad exposure, ad intrusiveness, and ad irrelevancy, whereas the organism refers to psychological components such as ad fatigue, and the response encompasses avoidance responses and purchasing decisions (Li et al., 2023; Fernandes & Oliveira, 2024; Sharma et al., 2023; Dhir et al., 2018; Dwivedi et al., 2021). More recent research has transferred the SOR framework to social media, thus justifying its place in the understanding of consumer outcomes caused by too prolific and ill-designed ad content. For this reason, the SOR model is very suitable for this study; it offers a methodological framework in which the transition between attention and avoidance of the digital advertising environment can be studied.

The framework of Cognitive Load Theory (CLT)

According to the Cognitive Load Theory (CLT), advertising overload also creates problems for consumers' information processing, beyond that of the SOR theory. The contents of Cognitive Load Theory are that people have a limited amount of cognitive capacity. When the amount of information is too high and/or complex, it causes people to become overloaded and thus leads to less efficient decision-making (Dhir et al., 2018; Li et al., 2023; Zhang et al., 2016). In digital advertising contexts, people become more 'over-pumped' with ads

over time and have less ability to process information effectively. New studies underscore the notion of ad fatigue and its ability to give rise to mental fatigue and disinterest, which align with the significance of CLT introduced above. So, Cognitive Load Theory is complemented with the SOR construction in that, in addition to affecting sport to advertising translation, it offers a cognitive explanation of how the advertising stimuli lead to psychological exhaustion.

Psychological Reactance Theory

The Psychological Reactance Theory (PRT), a theory that accounts for how individuals react to threats to their sense of freedom and autonomy, is another important view relevant to this research. This theory claims that a consumer's sense of privacy is violated when the advertisement is perceived as intrusive or manipulative, resulting in "psychological reactance," which manifests as resistance behaviors, including avoiding and rejecting marketing messages (Fernandes & Oliveira, 2024; Sharma et al., 2023). Ads in the digital world, when being intrusive and interrupting the user's activities, leave negative emotional impressions and decrease the efficacy of the advertising strategy. Recent research work has shifted focus toward the avoidance behavior, which is powered by reactance, which is also considered a crucial point in understanding the process of avoidance behavior as a consequence of ad fatigue and behavioral disengagement. Thus, this theory will reinforce the study according to advertising intrusiveness with avoidance outcomes.

Supporting & Negating Views

The linkage of advertising exposure and consumer behaviour has been investigated quite extensively in the marketing research literature, and we observe both positive and negative views. The existing literature shows that greater exposure to advertising leads to better brand awareness, brand recall, and purchase intention, which in turn boosts the reinforcement of brand messages and brand perceptions (Li et al., 2023; Sharma et al., 2023; Dwivedi et al., 2021; Pan et al., 2024). Repeated exposure and familiarity build trust and develop positive behaviors from this perspective. Contrary to that, however, opponents believe that too much exposure can also create too big a problem, resulting in saturation of content and consumers becoming numb and bored (Fernandes & Oliveira, 2024; Mäder, 2024). The distance here shows how complicated it is to connect with people through ads: Getting them in front of people a certain number of times is important, but they shouldn't tolerate it for too long a period.

Ad Irrelevance and Ad Fatigue

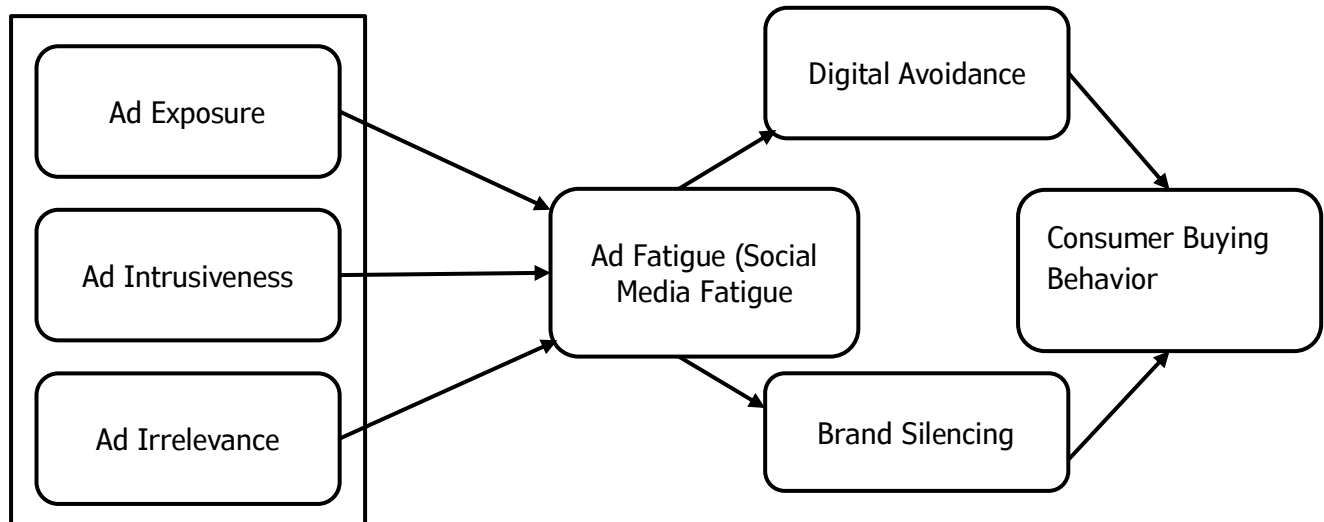
Further existing literature is strongly supportive of the link between advertising irrelevance and ad fatigue, as consumers are dissatisfied with advertising messages that are not relevant to them. Consumers exposed to content that is unrelated to the content they are interested in experience increased cognitive effort and frustration, which leads to a product problem of fatigue (Li et al., 2023; Sharma et al., 2023; Feng et al., 2024). This corresponds with the Uses and Gratifications theory, which posits the idea that viewers will tend to drop in on media they don't feel a need for. Thus, irrelevance is a key factor in creating fatigue in digital ad settings.

Ad Fatigue and Digital Avoidance

It's always been associated with digital avoidance; consumers are trying to avoid all the advertising information that they see as 'too much'. Fatigue makes it likely that people will skip, ignore, or block ads as coping strategies (Fernandes & Oliveira, 2024; Sharma et al., 2023; Mäder, 2024). In line with SOR theory, which states that avoidance is a response to fatigue (organism), this link is confirmed. The results indicate that fatigue acts as a mediator in advertising stimuli to behavioral disengagement.

Figure 1

Conceptual Framework



Hypothesis Development

Ad Exposure and Ad Fatigue

The role of advertising exposure in consumer psychological responses in digital environments is an important one. Changing behaviors and fostering effective processing of marketing messages could be challenging for consumers who are constantly inundated with advertisements. Recent studies have indicated that repeated ad exposure could cause cognitive overload and fatigue in consumers (Chung et al., 2023; Mäder, 2024; Fan et al., 2024). A high level of advertising saturation on digital media means that consumers see the same ads over and over, wearing off the novelty factor and attention. This will cause a decrease in user engagement and will lead to irritation and boredom in users. On the cognitive side, overstimulation can make the process of absorbing information too overwhelming for consumers, thereby playing a big part in ad fatigue.

H1: The influence of Ad Exposure is positive on Ad Fatigue.

Ad Intrusiveness and Ad Fatigue

Another important consideration that can impact consumers' psychological reactions when they are faced with digital marketing is the intrusiveness of the advertising. Users get irritated and emotionally stressed by disruptive ads during browsing, as information is often unexpectedly presented and disturbs their work (Chung et al., 2023; Mäder, 2024). Pop-ups, auto-play videos, forced ads, and similar formats are more intrusive in social media environments and have a negative impact on user experience. Such interruptions can make sites less engaging and end up causing cognitive overload and fatigue. Negative emotions are enhanced when ads are felt to be irrelevant or abundant, which increases the sense of intrusion.

H2: Ad Intrusiveness has a positive effect on Ad Fatigue.

Ad Irrelevance and Ad Fatigue

In advertising, irrelevance refers to the lack of an appropriate match between the desired needs of the consumer and the content of the adverts. Beyond not being of any assistance to natural search results, these ads can be particularly frustrating and can even cause cognitive overload (Chung et al., 2023; Fan et al., 2024). Although there are powerful personalisation toolsets available online, most ads are generally not relevant because they are not well-targeted, or they are shown too many times. This irrelevance makes advertising less effective and helps create a bad user experience, which can lead to fatigue.

H3: The more positive the value, the less sensitive the advertisers are.

Ad Fatigue and Brand Silencing

The effects of ad fatigue also play a role in deeper instances of avoiding ads, like brand silencing. As consumers become fatigued, they are more apt to take other actions such as muting, unfollowing, and blocking brands (Maier et al., 2015; Mäder, 2024; Chung et al., 2023). Such behaviors reflect a more pronounced response than in cases of passive avoidance behaviors, suggesting greater discontent with the advertising material. The goal with brand silencing is to regain control of consumers' digital lives by decreasing their exposure to unwanted brand messages.

H4: Ad Fatigue has a positive effect on Brand Silencing.

Digital Avoidance and Consumer Buying Behavior

The consequences of digital avoidance on consumer purchasing behavior include restricted viewing of ads and decreased brand engagement. Active avoidance of ads reduces the likelihood of having purchase intentions to develop and the consideration of purchase during the product-decision-making process (Dwivedi et al., 2021; Huh & Kim, 2024; Dasmi et al., 2024; Kemp, 2023). This exposure decrease reduces the grip that marketing has on purchase, resulting in poorer purchasing results.

H5: Digital Avoidance has a negative effect on Consumer Buying Behavior.

Ad Fatigue, Ad Exposure, and Digital Avoidance

Ad exposure has a significant impact on consumer behavior, which interacts with another intervening variable, namely ad fatigue. Exposure increases cognitive load, lowers consumers' capacity to process the adverts, thereby causing psychological exhaustion (Chung et al., 2023; Mäder, 2024; Fan et al., 2024). This fatigue then leads to avoidance behaviours, which will help to limit further exposure to the stimuli perceived as overwhelming. From the SOR theory, anglers from the 'exposure' (stimulus), reach the 'fatigue' (organism), and ultimately end up with 'digital avoidance' (response). This route is supported by empirical research, which suggests that frequent exposure causes people to disengage and become less engaged with advertorial content.

H6: Digital Avoidance is a mediation of the relationship between Ad Exposure and Ad Fatigue.

Ad Exposure, Ad Fatigue, and Brand Silencing

Ad exposure is also indirectly responsible for ad-driven brand silencing by creating ad fatigue — a deeper level of consumer disinterest and mistrust. When exposed to ads repeatedly, consumers become cognitively and emotionally exhausted and thus less motivated to engage with ads and brand (Chung et al., 2023; Dehling, 2023). Consumers are likely to become hypervigilant about the brand's actions as their fatigue grows, including muting and unfollowing the brand. This implies that fatigue is a key factor that connects exposure with brand deengagement.

H7: Ad Fatigue mediates the relationship between Ad Exposure and Brand Silencing.

Ad Fatigue is the mediator between Ad Intrusiveness and Digital Avoidance.

Ad Fatigue is also the moderating factor between ad intrusiveness and brand silencing as another level of consumer disaffection. Because of the negative emotional responses to intrusive ads, there is an expectation that their presence will cause user fatigue and decrease their interest in brands (Chung et al., 2023; Mäder, 2024; Dehling, 2023). As a consumer's fatigue increases, he or she is more likely to take radical steps like muting or blocking a brand – this means he or she is more dissatisfied.

H8: Ad Fatigue has a mediating role between Ad Intrusiveness and Brand Silencing.

Ad Irrelevance, Ad Fatigue, and Digital Avoidance

Ad irrelevance is a mediation mechanism on digital avoidance caused by consumers' low expectations towards the ads since the advertising strategy fails to be relevant. Premise and branding will make the users feel more satisfied and less fatigued after seeing relevant ads, while irrelevant ads will cause higher cognitive load and lower perceived value, which will lead to dissatisfaction and fatigue (Chung et al., 2023; Fan et al., 2024). When content that isn't relevant to their interests is encountered, consumers become disengaged and feel psychologically exhausted, which can also result in avoidance behavior.

H9: suggests that Digital Avoidance buffers the relationship between Ad Irrelevance and Ad Fatigue.

Ad Irrelevance, Ad Fatigue, and Brand Silencing. To Ad Irrelevance, Ad Fatigue, and Brand Silencing

This type of "irrelevance" additionally contributes to the silencing of brands with the kind of ad fatigue that becomes an increasingly serious form of consumer indifference. Though adverts are not useful, they cause us dissatisfaction and strain on our cognitive processes, which leads to fatigue (Chung et al., 2023; Dehling, 2023). This wear wears down customers' likelihood to interact with brands and encourages disengagement, such as unfollowing or blocking.

H10: Ad Fatigue mediates the relationship between Ad Irrelevance and Brand Silencing.

Conceptualization

The conceptualization of the present study is based on the fusion of existing theoretical frameworks, mainly Stimulus-Organism-Response (SOR) Theory, which is complemented by the Cognitive Load Theory and Psychological Reactance Theory, in order to discuss consumer behavior in the digital world in the light of advertising stimuli. Prior studies have largely explored the direct impact of advertising stimuli (including exposure, intrusiveness, and relevance) on consumer engagement and attitudes, as well as how these stimuli influence consumer purchase intentions and response behaviors (e.g., Li et al., 2023; Sharma et al., 2023; Fernandes & Oliveira, 2024; Dwivedi et al., 2021; Appel et al., 2020). Additionally, previous research indicates that ad fatigue is a type of psychological phenomenon that diminishes engagement and results in avoidance reactions, especially when coming to social media settings. Most of these studies have been dedicated to engagement outcomes or the study of a singular behavior; however, few have integrated multiple avoidance behaviors into a single model. Hence, although there are important advances in understanding the impact of advertising stimuli on consumer reactions, a greater understanding and modelling of the relationship from attention to avoidance, and its ultimate effects on consumer purchasing behaviour, has yet to be achieved.

Methodology

In the present study, the research method used is quantitative research because the research problem in this study is to investigate the relationship between advertising stimuli, ad fatigue, avoidance behavior, and consumer buying behavior in digital environments. In marketing research, quantitative research is employed to assess the relationships between variables and test hypotheses using statistical methods, such as correlation analysis, regression analysis, and analysis of variance (Hirose & Creswell, 2023; Dwivedi et al., 2021). This method is more appropriate for the current research, where the conceptual framework can be empirically tested, and the direction and strength of relationships between constructs can be measured. Furthermore, quantitative methods yield objective and universal results that are crucial for grasping consumer behaviour in digital marketing scenarios.

Research Design

The choice of a quantitative research design in this study is motivated primarily by the requirement of testing the proposed relationships between a number of constructs in an empirically structured conceptual framework. In particular, quantitative methods are useful for analysing cause and effect relationships and testing theoretical models through statistical methods (Hirose & Creswell, 2023; Kamal et al., 2024; Dwivedi et al., 2021). As this study examines the relation between the factors of advertisement and the consumers'

behavior with the help of its mediating variables, which are ad fatigue and ad avoidance, a quantitative method of research would enable this study to measure these variables accurately and also test the hypothesis. Moreover, the quantitative design approach increases objectivity and generalizability of the results, which are applicable to digital marketing research.

A cross-sectional research design is appropriate since the research is to obtain consumers' perceptions and behaviours at one particular time. Cross-sectional designs are widely used in behavioral and marketing research due to their efficiency and ability to provide immediate insights into relationships among variables (Hirose & Creswell, 2023; Fan et al., 2024). A cross-sectional approach is appropriate for the analysis of the effects of ad exposure, ad fatigue, and avoidance in a digital advertising context where consumer behavior is dynamic but is measurable in real time. The cross-sectional design will be sufficient for the testing of the hypotheses and validation of the conceptual model, although longitudinal designs would provide greater insight into changes in behaviors over time.

Sampling

This study adopts the data collection method of a survey technique with a structured questionnaire that is commonly used in marketing and behavioral research to obtain standardized responses from the subjects. Distributing surveys online is especially well-suited for digital advertising research, since it enables access to social media users who are actively using social media platforms (Dwivedi et al., 2021; Hirose & Creswell, 2023). The questionnaire is sent via digital means (social media, e-mail, online forms) to ensure participants from a wide range of sources. This approach allows for data collection in a consistent manner with the responses as quantitative data.

The target population for this study is social media users who are exposed to digital advertisements on a regular basis, as this is the most relevant population to look at ad fatigue and avoidance behaviours. These are people who actively use social media apps like Facebook, Instagram, TikTok, and YouTube. The choice of this population is supported by the fact that digital advertising is mainly delivered through these platforms, which shape the perception and behavior of their users (Li et al., 2023; Sharma et al., 2023; Pan et al., 2024). With attention to users who are actively engaging with social media, the data is aligned with real-world experiences related to advertising exposure and the resulting consumer behaviours.

Considering the nature of the data collection through online methods and the ease of access of respondents, the study uses a non-probability sampling technique of convenience sampling. In digital marketing research, the respondents are selected depending on their availability and willingness to participate, which is known as convenience sampling (Hirose & Creswell, 2023; Fan et al., 2024; Dwivedi et al., 2021). This way, data may be collected in a short time frame. While having some limitations for the generalizability, it was deemed suitable for exploratory and predictive PLS-SEM research.

Results and Discussion

The findings of the present study offered empirical evidence of the proposed conceptual framework to investigate the relationship between advertising factors, ad fatigue, ad avoidance, and consumer buying behavior. The results showed that both ad exposure and ad intrusiveness were significantly positively related to ad fatigue, offering evidence that exposure to ads and ad intrusiveness leads to psychological exhaustion for consumers. These findings concur with previous studies, which pointed out that the high degree of exposure and intrusive advertising formats cause cognitive overload and less consumer engagement (Li et al., 2023; Sharma et al., 2023; Feng et al., 2024). The study, however, reveals that ad irrelevance does not significantly contribute to ad fatigue, meaning that irrelevant ads do not necessarily result in ad fatigue, especially when consumers are just ignoring the ads and do not engage with them.

Reliability and Validity Analysis

Table 1

Reliability and Validity Analysis

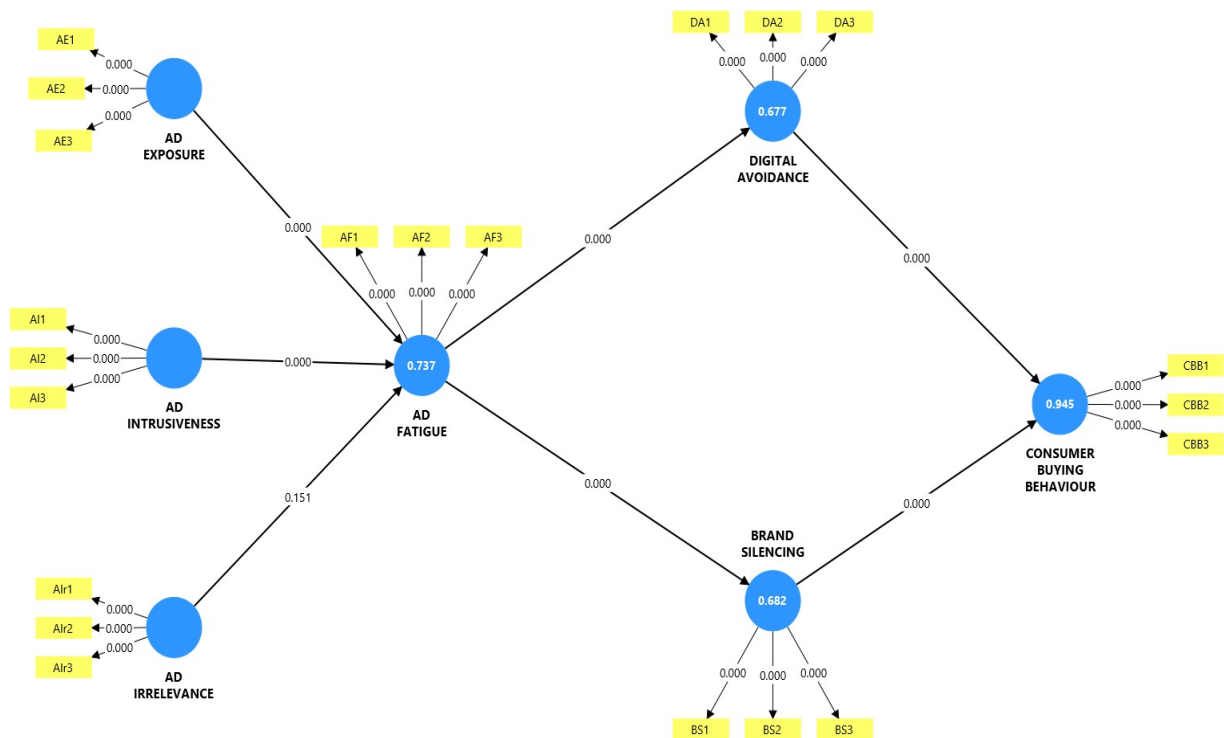
Construct reliability and validity				
Overview				
	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
AD_EXPOSURE	0.887	0.888	0.930	0.815
AD_FATIGUE	0.862	0.865	0.916	0.784
AD_INTRUSIVENESS	0.832	0.841	0.899	0.747
AD_IRRELEVANCE	0.908	0.910	0.942	0.844
BRAND_SILENCING	0.853	0.862	0.911	0.772
CONSUMER_BUYING_BEHAVIOUR	0.843	0.845	0.905	0.761
DIGITAL_AVOIDANCE	0.856	0.857	0.912	0.776

Based on the results of the construct reliability and validity, all measurement scales used in this study show good internal consistency and convergent validity. In particular, Cronbach's alpha for all constructs was above the recommended 0.70 and ranged from 0.832 to 0.908, which indicated good reliability. Further, all constructs show composite reliability values (rho_a and rho_c) above 0.80, which is considered a high level of internal consistency among the indicators (Hair et al., 2021; Sarstedt et al., 2022). In addition, the Average Variance Extracted (AVE) values vary from 0.747 to 0.844, which exceeded the minimum threshold of 0.50, suggesting that the constructs account for a large amount of variance in their respective indicators (Henseler et al., 2015). Overall, these results show that the measurement model is reliable and valid, which can be used in the analysis of the structural model.

PLS SEM Bootstrapping

Figure 2

PLS SEM Bootstrapping



The results of the bootstrapping analysis show that the majority of hypothesized relationships in the structural model are statistically significant (p -values = 0.000), which supports the strong empirical support for the hypothesized model. Specifically, ad exposure and ad intrusiveness are found to have a significant effect on ad fatigue, indicating that high frequency and high intrusiveness of ads are responsible for making consumers feel exhausted. On the other hand, ad irrelevance does not affect ad fatigue (p = 0.151), suggesting that irrelevant ads might not lead to ad fatigue because consumers do not process irrelevant ads but simply ignore them. In addition, ad fatigue shows a significant and strong influence on digital avoidance and brand silencing, thus establishing itself as a key mediating factor in the relationship between advertising stimuli and behavioral responses.

Hypothesis Testing

Table 3

Hypothesis Testing

Path coefficients					
Mean, STDEV, T values, p values					
	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
AD_EXPOSURE -> AD_FATIGUE	0.379	0.373	0.083	4.585	0.000
AD_FATIGUE -> BRAND_SILENCING	0.826	0.825	0.023	35.833	0.000
AD_FATIGUE -> DIGITAL_AVOIDANCE	0.823	0.822	0.025	32.594	0.000
AD_INTRUSIVENESS -> AD_FATIGUE	0.385	0.384	0.082	4.711	0.000
AD_IRRELEVANCE -> AD_FATIGUE	0.143	0.150	0.099	1.437	0.151
BRAND_SILENCING -> CONSUMER_BUYING_BEHAVIOUR	0.283	0.283	0.036	7.942	0.000
DIGITAL_AVOIDANCE -> CONSUMER_BUYING_BEHAVIOUR	0.725	0.725	0.033	21.874	0.000

The path coefficient results demonstrate that most of the hypothesized relationships in the model are statistically significant and positive, indicating strong support for the proposed framework. Specifically, ad exposure (β = 0.379, p = 0.000) and ad intrusiveness (β = 0.385, p = 0.000) both have significant positive effects on ad fatigue, suggesting that frequent and disruptive advertisements contribute to consumers' psychological exhaustion. Additionally, ad fatigue strongly influences both brand silencing (β = 0.826, p = 0.000) and digital avoidance (β = 0.823, p = 0.000), with very high t-values, indicating that fatigue is a powerful driver of avoidance behaviors. These findings confirm that ad fatigue acts as a central mediating variable, transforming advertising stimuli into behavioral responses.

Mediation & Moderation Analysis

Table 4

Mediation & Moderation Analysis

Specific indirect effects					
Mean, STDEV, T values, p values					
	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
AD_FATIGUE -> BRAND_SILENCING -> CONSUMER_BUYING_BEHAVIOUR	0.233	0.233	0.030	7.762	0.000

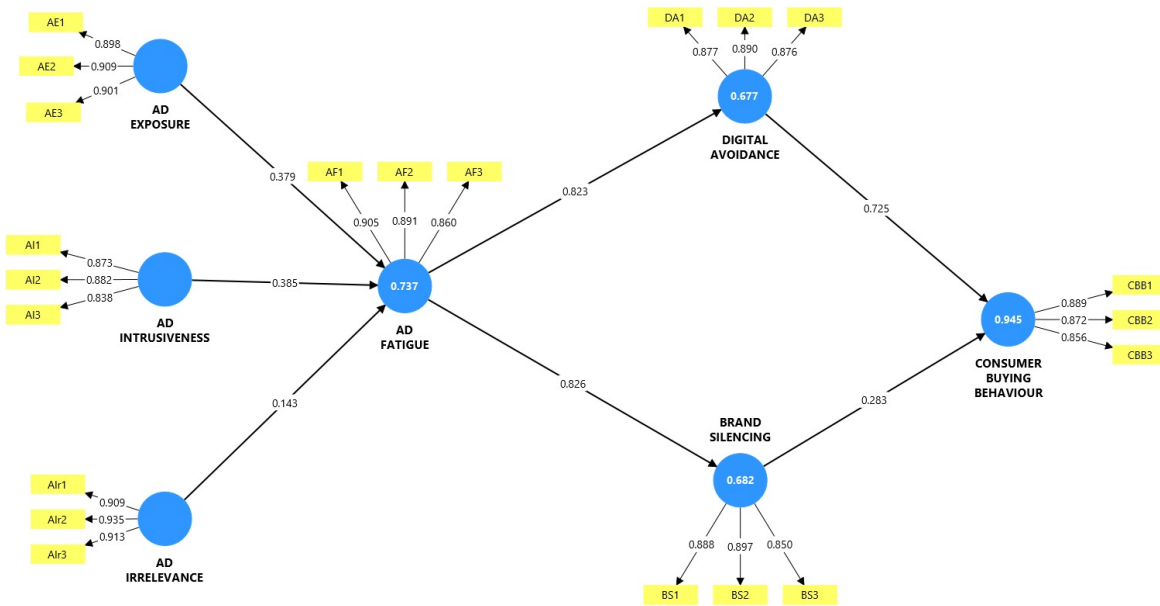
AD_EXPOSURE -> AD_FATIGUE -> BRAND_SILENCING	0.313	0.308	0.070	4.505	0.000
AD_EXPOSURE -> AD_FATIGUE -> DIGITAL_AVOIDANCE	0.312	0.307	0.069	4.509	0.000
AD_INTRUSIVENESS -> AD_FATIGUE -> BRAND_SILENCING	0.318	0.317	0.069	4.614	0.000
AD_IRRELEVANCE -> AD_FATIGUE -> BRAND_SILENCING	0.118	0.124	0.082	1.442	0.149
AD_INTRUSIVENESS -> AD_FATIGUE -> DIGITAL_AVOIDANCE	0.317	0.316	0.070	4.554	0.000
AD_IRRELEVANCE -> AD_FATIGUE -> DIGITAL_AVOIDANCE	0.117	0.123	0.081	1.445	0.149
AD_EXPOSURE -> AD_FATIGUE -> BRAND_SILENCING -> CONSUMER_BUYING_BEHAVIOUR	0.089	0.087	0.023	3.882	0.000
AD_INTRUSIVENESS -> AD_FATIGUE -> BRAND_SILENCING -> CONSUMER_BUYING_BEHAVIOUR	0.090	0.089	0.022	4.174	0.000
AD_EXPOSURE -> AD_FATIGUE -> DIGITAL_AVOIDANCE -> CONSUMER_BUYING_BEHAVIOUR	0.226	0.222	0.051	4.443	0.000
AD_IRRELEVANCE -> AD_FATIGUE -> BRAND_SILENCING -> CONSUMER_BUYING_BEHAVIOUR	0.033	0.035	0.024	1.373	0.170
AD_INTRUSIVENESS -> AD_FATIGUE -> DIGITAL_AVOIDANCE -> CONSUMER_BUYING_BEHAVIOUR	0.230	0.229	0.053	4.369	0.000
AD_IRRELEVANCE -> AD_FATIGUE -> DIGITAL_AVOIDANCE -> CONSUMER_BUYING_BEHAVIOUR	0.085	0.089	0.058	1.454	0.146
AD_FATIGUE -> DIGITAL_AVOIDANCE -> CONSUMER_BUYING_BEHAVIOUR	0.597	0.596	0.032	18.893	0.000

The results of the specific indirect effects reveal that the concept of ad fatigue has an important and significant mediation on the model provided, that is, as a mediator between the concept of advertising stimuli and the avoidance concept, and finally to the consumer buying concept. There are indirect paths between ad exposure and brand silencing and between ad exposure and digital avoidance, both of which are significant with values of $\beta = 0.313$, $p = 0.000$, and $\beta = 0.312$, $p = 0.000$, respectively. Also, ad intrusiveness indirectly impacted website brand silencing ($\beta = 0.318$, $p = 0.000$) and digital avoidance ($\beta = 0.317$, $p = 0.000$)**, through its impact on ad fatigue, suggesting that intrusive ads increase ad fatigue, leading to avoidance behaviors. Also, the highest indirect effect happens between ad fatigue and consumer buying behaviour ($\beta = 0.597$, $p = 0.000$), indicating that digital avoidance is one crucial pathway between ad fatigue and consumer buying behaviour.

PLS SEM

Figure 3

PLS SEM



The outcomes of the structural model confirm that the proposed model has an explanatory value and delivers an important insight into consumer behaviour in a digital advertising context. Based on the measurement model, the reliability score is also above the suggested value of 0.70, and the factor loadings of all indicators are also above the indicated value, thereby confirming that there is high indicator reliability and convergent validity of the study models. In the structural model, ad exposure ($\beta = 0.379$) and ad intrusiveness ($\beta = 0.385$) are positive and moderately significant, suggesting that the repeated and intrusive exposures to ads lead to their fatigue. On the other hand, the relevance of the ad doesn't seem to have much effect on it, as ads are becoming irrelevant ($\beta = 0.143$), which has a weak and statistically insignificant effect, which may be due to consumers' tendency to overlook the relevant ads as they are of no interest.

Model Fitness

Table 5

Model Fitness

Model fit		Fit summary	
		Saturated model	Estimated model
SRMR		0.061	0.073
d_ULS		0.871	1.229
d_G		n/a	n/a
Chi-square		infinite	infinite
NFI		n/a	n/a

Based on the model fit result, the model that is proposed shows an acceptable model fit. In particular, the SRMR for the saturated model (0.061) and the estimated model (0.073) are lower than the suggested value of 0.08, which shows a good model fit and indicates less discrepancy between the observed and predicted correlations (Hair et al., 2021; Iqbal et al., 2023; Sarstedt et al., 2022). Due to the lack of the bootstrapped thresholds, though the d_ULS values are reported (0.871, 1.229), an interpretation of them is limited. Furthermore, the lack of values of d_G and NFI, as well as the infinite Chi-square, are common in PLS-SEM

analysis; this model doesn't use covariance fit indices. In general, the overall results of the SRMR indicate that the model has an appropriate level of appropriateness in explaining the object of the study.

Discussion

Based on the present study, the results lead to solid support for the proposed framework and also provide a significant theoretical contribution, including as an extension of Stimulus–Organism–Response (SOR) theory in the context of digital advertising. The results support the predictive role that advertising stimuli (ad exposure and ad intrusiveness) have on the psychological experience of ad fatigue and on the behavioral consequences of the ad fatigue phenomenon, including digital avoidance and brand silencing. This resonates with recent research highlighting the need for cognitive overload and emotional tiredness among consumers when it comes to repeated and disruptive advertising (Li et al., 2023; Sharma et al., 2023; Chung et al., 2023). This robust mediating path of ad fatigue further supports the SOR framework because the consumer's reaction is not a direct one, but rather, internal psychological processes are involved. An advertisement irrelevance effect is not a significant relationship for all theory assumptions, as is the ad fatigue effect; however, not all negative features of an ad are equally contributing to ad fatigue. This suggests that SOR theory holds true; the impact of the stimulus can be contingent on consumer perception and processing of various elements of the advertising stimuli.

Conclusion

This study aimed to analyze how exposure to advertising stimuli affects the consumer's buying behavior by intervening factors such as ad fatigue, digital avoidance, and digital silencing. Results of the findings indicate that the proposed relationships are mostly empirically supported and that ad exposure and intrusiveness increase ad fatigue, and that ad fatigue increases in turn avoidance behaviors and has an impact on purchasing. The findings are consistent with the escalating worry concerning the impact of overabundant and disruptive ads on consumer engagement and decision-making that has surfaced in recent times (Li et al., 2023; Sharma et al., 2023; Fernandes & Oliveira, 2024). The study also shows that ad irrelevance has little impact on ad fatigue, indicating that when ads are irrelevant, consumers likely disregard the ad and may not feel psychologically fatigued. This is one of the key aspects consumers may not fully grasp regarding digital advertising's effectiveness.

Future Research Direction

This study can be used in a number of ways for future research. First, because ad irrelevance proved to have no effect at all on ad fatigue, future research should focus on factors that may mediate the relationship, including the quality of the personalization, the perceived usefulness of the personalized content, and consumer involvement in the experience. Second, researchers are urged to use longitudinal studies to understand the progression of ad avoidance and ad fatigue behaviors over time, as cross-sectional data might not be a complete picture of the dynamics of consumer responses (Hirose & Creswell, 2023; Fan et al., 2024; Kamal et al., 2024). Third, more research can be done to include other constructs like trust, perceived value, or emotional involvement, which can enhance the overall understanding of the consumer's behaviour in the digital context. Furthermore, cross-cultural and/or cross-regional comparisons might provide further insights because the consumer response to the adverts may be different in each market. Lastly, it is worth noting an unexpected positive correlation between avoidance behaviors and consumer buying behavior, indicating that a greater extent of this relationship needs to be researched, both with regard to measuring scales and the presence of indirect exposure effects, to validate or further refine the current findings.

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