

Unlocking Advertising Potentials of Live-Streaming Platforms: Investigating the Impact of Telepresence and Flow on Advertising Avoidance on Twitch

By Nam Young Kim^{}, Ki Won Seo[±] & Masudul Biswas[°]*

Twitch provides a unique opportunity for exploring how users' experiences on live-streaming platforms, characterized by immersive virtual environments full of sensory richness and real-time interactivity, intersect with their perceptions of intrusive ad interruption. Given the frequent exposure of Twitch users to in-stream video advertisements, this research aims to unlock the psychological mechanism of advertising acceptance on Twitch. Expanding the psychological reactance framework, the researchers have developed a comprehensive theoretical framework that examines the intricate interplay between users' telepresence, flow experience, their reactance toward in-stream video ads, and the subsequent outcomes of such reactance (i.e., ad avoidance) within the context of live-broadcasts. The results of an online survey ($N=297$) show that having a high flow status on Twitch appears to intensify users' reactance toward ad invasiveness and ad avoidance. Notably, anger emerges as a dominant cause for reactant users' avoidance of advertising. This study's key findings are discussed in-depth, along with theoretical and practical implications.

Keywords: live streaming platforms, telepresence, flow, reactance, ad avoidance, Twitch

Introduction

Digital innovation changes the ways we consume and experience content across different media platforms. Now, people not only value specific media content but also seek a unique experience on the media platform as well as engagement with the platform. Twitch has embraced this trend and grown to become one of the most popular destinations for people looking for a highly interactive entertainment and global community experience. According to recent business trends, this interactive broadcast, also known as live broadcasts or streams, continues to grow in popularity. The 2022 industry report informed that Twitch topped the streaming market with 78.6% market shares by hours watched up, followed by YouTube Gaming with 16.2% and Mixer and Facebook Gaming with 5.3% (Stream Labs & Stream Hatchet, 2022). Twitch also held an average viewership of around 2,578,000 people, approximately 1346 billion minutes of video

^{*}Professor, Department of Mass Communication, Sam Houston State University, USA.

[±]Associate Professor, Department of Mass Communication, Sam Houston State University, USA.

[°]Professor, Loyola University Maryland, USA.

were viewed by Twitch users, and 92,600 average live channels streamed a variety of content (Twitch Tracker, 2022). With a continued increase in active younger users and time spent on Twitch by users, marketers view Twitch as an excellent platform for reaching young audiences, given that 75% of Twitch users are between the ages of 18 and 34 (Twitch Tracker, 2022). In line with the platform's remarkable business potential, Twitch's revenues surged to a staggering \$2.8 billion in 2022 (Business of Apps, 2023). Moreover, Twitch has continued offering a variety of advertising options for both advertisers and streamers, allowing them to optimize their profits.

On Twitch, one of the most popular advertising formats is in-stream video advertising, now known as *Twitch Premium Video*, which appears during a live broadcast or when viewers load a live stream's channel (Twitch Ads, 2023). Given that Twitch's in-stream video advertising appears as an unrippable format on the stream window, incorporated into Twitch live broadcasts, exposure to in-stream video advertising is inevitable on Twitch unless users subscribe to a channel or use a Twitch Turbo subscription. In the context of online advertising effectiveness, extensive research contends that forceful advertising interruptions can diminish users' perceived control over the web interface and heighten ad avoidance tendencies due to psychological reactance (Campbell et al., 2017; Lee et al., 2016; Li et al., 2002; Yaveroglu & Donthu, 2008).

According to psychological reactance theory (PRT), individuals may experience psychological reactance in environments where their own freedom is constrained owing to an external force (Brehm, 1966, 1972). This loss of autonomy can further elicit a desire for reactance, prompting individuals to engage in activities aimed at preventing additional loss of freedom, a phenomenon is known as a boomerang effect (Brehm & Brehm, 1981; Clee & Wicklund, 1980; Quick & Kim, 2009; Quick & Stephenson, 2008). While prior research has extensively explored advertising avoidance in a range of contexts, the landscape of live-streaming platforms remains relatively unexplored within the advertising discipline. Therefore, understanding the intricate psychological processes underlying ad interruption and ad avoidance on live-streaming platforms is imperative, as it holds the potential to uncover novel perspectives on users' experiences within these dynamic media platforms.

In the case of Twitch, it stands out as an excellent live-streaming platform, providing a highly interactive experience through *live-streaming and real-time interaction*. The majority of content on Twitch comes from live-streaming, which records and broadcasts real-time sounds and images from an event, and broadcasters and viewers can engage with each other throughout live-streaming. As a result, instant transmission and real-time human interaction frequently induce feelings of being there (Chen & Lin, 2018; Hilvert-Bruce et al., 2018), which may impact users' perceptions of ad interruption within this immersive media platform. Despite Twitch's popularity as a live-streaming service, little is known about the factors that influence advertising effectiveness on the platform. Therefore, using PRT as a central framework, this study aims to develop and test an integrated theoretical model to understand how Twitch users' immersive experiences on live-streaming intersect with their perceptions of in-stream video advertising within the live-broadcast platform. By examining the relationship between users' perceived

telepresence, flow experience, and their perceptions of forceful ad interruption, the focal point of this research is to bridge the theoretical gap in our understanding of advertising avoidance tendencies in emerging digital environments. For practical implication, the study findings can provide practical guidance to advertisers navigating this evolving landscape and shed light on how advertisers can optimize their advertising strategies to align with users' experiences, ultimately improving users' attitudes toward ads on live-streaming platforms.

Literature Review

Telepresence and Flow Experience on Twitch

One unique aspect of computer-mediated communication is that users can feel a sense of being immersed, also known as telepresence, in the online environment (Steuer, 1992). In general, *telepresence* is the feeling of being present in a mediated environment rather than one's physical environment (Biocca, 1992; Kim & Biocca, 1997). When technological affordance allows users to interact with the mediated environment and provides a level of realism, it can generate a sense of telepresence (Coyle & Thorsen, 2001; Hernandez, 2011; Johnson & Wiles, 2003). With the growing popularity of an interactive medium, scholars have explored the causes and consequences of telepresence (Hoffman & Novak, 1996; Lombard & Ditton, 1997; Steuer, 1992) and identified two essential attributes of telepresence, vividness, and interactivity. While interactivity is viewed as the medium's ability to allow users to make real-time changes to the content and platform features in a mediated environment, vividness is defined as the sensorial richness of the mediated environment through the presentation of graphic and more sensory content (Steuer, 1992). For instance, when a website presents explicit content and creates a more interactive and realistic virtual environment, scholars find that web users actively interact with the content, enhancing their perceptions of being transported to the website (Coyle & Thorsen, 2001).

Applying the concept of telepresence to Twitch, Twitch allows streamers to transmit real-time video and audio from their homes to viewers all over the world. For instance, video game streamers often embed a real-time webcam into their live gaming, allowing viewers to watch the streamers' gameplay and see their live broadcasting streams. This live-streaming platform setting frequently creates a sensory-rich atmosphere and allows Twitch viewers to communicate in real time in a chat room with other viewers and the streamer. During their engagement in a chat room, viewers can express their thoughts about the streaming channel and streamers, discuss unrelated or related topics to the streaming content, and socialize with others (Hu et al., 2017). Therefore, it is expected that Twitch users' active engagement in real-time interaction, media richness, and a significant number of sensory experiences in the live-broadcast platform would strengthen their perceptions of telepresence (Bründl et al., 2017).

When people are absorbed in an online activity, their feelings of telepresence can

lead to a state of flow (Hoffman & Novak, 1996; Huang et al., 2011; Kim & Biocca, 1997; Van Noort et al., 2012). In online communication, *flow* is a state of concentration in which users are involved in their actions and focused on the content in the mediated environment (Hoffman & Novak, 1996). Several scholars emphasize that flow experiences boost individuals' level of arousal and loss of time pass and even lead them to forget tasks they should complete, which may result in their positive attitudes towards the interactive interface. For instance, studies on social media platforms (Hung et al., 2016) and instant messages (Lu et al., 2009) discovered that users' flow experience strengthens the perceived value of a website and behavioral intention to use the platform (Wu, 2009). In conjunction with the characteristics of Twitch and concepts of telepresence and flow, the researchers, therefore, hypothesize:

H1: Twitch users' perceptions of telepresence will positively impact their Twitch flow experience.

The Effect of Twitch Users' Flow Experience on Reactance and Ad Avoidance

Advertising intrusiveness is often seen as one of the primary causes of annoyance and a leading factor in ad avoidance on numerous occasions (Brechman et al., 2016; Edwards et al., 2002; McCoy et al., 2008; Li et al., 2002; Li & Lo, 2015; Rejón-Guardia & Martínez-López, 2014; Smith, 2011). The intrusiveness of advertising is defined as an ad's ability to obstruct users' exposure to or active involvement in media content (Edwards et al., 2002; Goldfarb & Tucker, 2011; McCoy et al., 2008; Li et al., 2002). While a higher degree of forced exposure can increase users' awareness of advertisements, several scholars are concerned that users' reactance toward intrusiveness can diminish their positive attitudes toward ads and behavioral intentions (Cho et al., 2001; Clee & Wicklund, 1980; Ha & McCann, 2008; Li et al., 2002; Stayman & Aaker, 1988). Notably, empirical studies confirm that internet users dislike invasive ads that interrupt their flow of media content consumption and goal-related activities (Bailey et al., 2001; Cho et al., 2001; Ha, 1996; McCoy et al., 2008).

One assuring theory that provides insight into how users respond to intrusive ad interruption on live-streaming platforms is the concept of psychological reactance. According to the psychological reactance theory (PRT), reactance or adverse reaction stems mainly from individuals' needs to preserve their autonomy in making their own decisions without being compelled by an external force (Brehm, 1966, Brehm & Brehm, 1981). Conceptually, scholars describe psychological reactance as the motivational counterforce to a threat to autonomy, and cognitive and emotional components are measured to understand how individuals respond to persuasive messages (Brehm & Brehm, 1981; Dillard & Shen, 2005). Prior research has discovered that when confronted with a threat to one's freedom, people exhibit a high level of reactance, including negative cognitions and anger. Particularly, in responding to reactance-inducing advertising messages, individuals experience unpleasant emotional states, such as anger, and develop counterarguments or critical thoughts (Lang, 2006). Furthermore, such psychological

reactance results in a wide range of outcomes, including changes in attention, attitudes, and behavioral changes (Kim et al., 2017; Quick & Stephenson, 2008; Ying et al., 2009). For instance, individuals tend to express their intention to maintain their initial attitudes (i.e., resistance) or change their perspectives in ways that contradict the intended goals of persuasive messages (i.e., persuasive boomerang) in order to rebuild a threatened autonomy (Kim et al., 2017; Quick & Stephenson, 2008).

Regarding online advertising effectiveness, several scholars underscore the role of reactance in explaining ad avoidance tendency in various ad formats, such as pop-ups (Edwards et al., 2002), personalized ads (Baek & Morimoto, 2012), and Facebook ads (Youn & Kim, 2019). *Ad avoidance*, in general, refers to media users' intended activities to reduce their exposure to ad content (Speck & Elliott, 1997). To better understand various advertising-avoidant activities, scholars have developed a conceptual model of ad avoidance that incorporates cognitive, affective, and behavioral avoidance (Fransen et al., 2015; Kelly et al., 2010; Li et al., 2002; Youn & Kim, 2019). In ad avoidance research, cognitive avoidance represents consumers' mental effort to ignore advertisements, behavioral avoidance refers to consumers' intended behaviors or activities to avoid advertisements, and affective avoidance refers to consumers' affective response to advertisements (Cho & Cheon, 2004). In the context of online advertising, scholars pay much attention to cognitive and behavioral avoidance because these avoidant activities are more apparent and definite avoidant activities than affective avoidance (Cho & Cheon, 2004; Fransen et al., 2015; Kelly et al., 2010; Li et al., 2002; McCoy et al., 2008; Rains, 2013; Youn & Kim, 2019). For instance, Youn and Kim (2019) find that Facebook users perceive Facebook newsfeed advertising as obtrusive due to the limited flexibility to utilize Facebook. As a result, perceived intrusiveness triggers anger and negative cognitions about advertisements, leading to cognitive and behavioral ad avoidance. Particularly, Youn and Kim's (2009) study examines cognitive ad avoidance with consumers' ignorance and inattention to advertising and measures behavioral avoidance with consumers' actions to block or conceal ads.

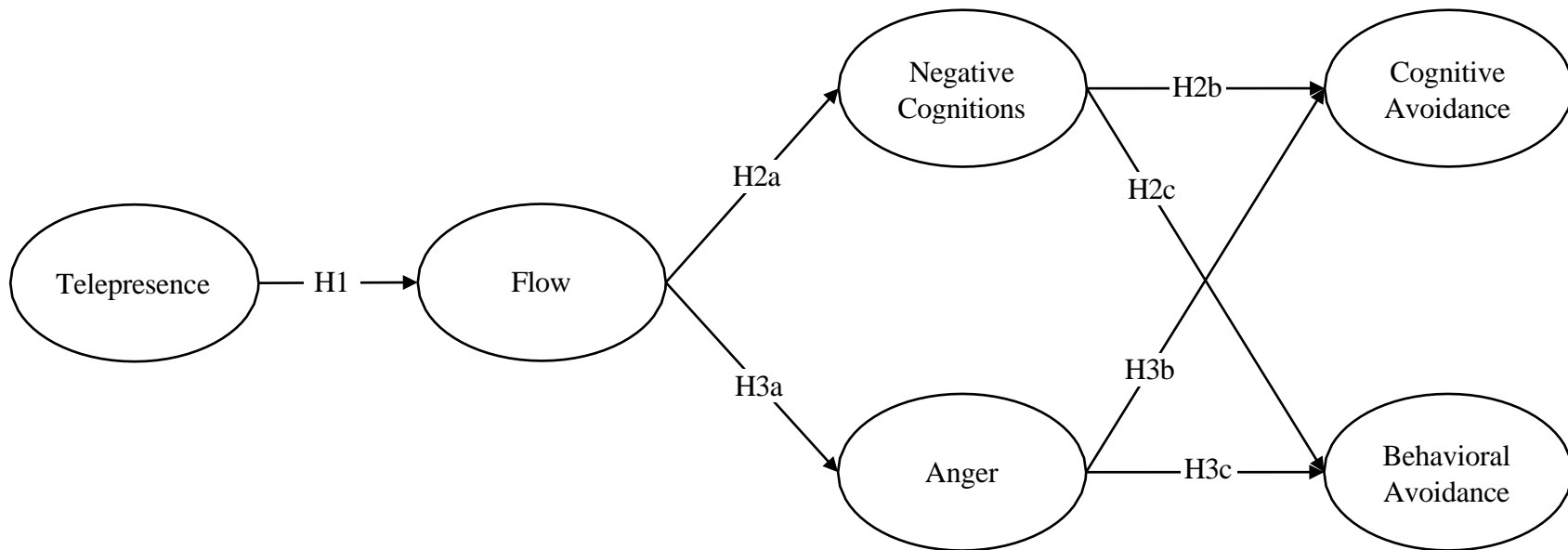
This study is rooted in this line of research in that the researchers use reactance as a mediator to explain how different types of ad avoidance can occur on a live-streaming platform. While individual variables in this research have been explored to some extent, this study takes a novel approach by integrating these variables into a comprehensive framework that has yet to be explored in the existing literature theoretically. On Twitch, in-stream video advertisements are more invasive as they completely obstruct users' ability to watch live broadcasts by overflowing the stream window. Considering users' active engagement and the format of ad interruption on Twitch, the researchers predict that in-stream video advertising interruptions have the potential to prevent users from accessing real-time streaming, interacting with streamers, and participating in the streams. Since Twitch users have no control over these ad interruptions, it is expected that ad intrusiveness can diminish their flow experiences and amplify their psychological aversion to disruptive ad interference (Duff & Faber, 2011). Empirical evidence indicates that such ad intrusiveness can heighten users' negative feelings and unfavorable evaluations of ads, leading to behavioral consequences such as ad avoidance (Li et al., 2002;

Morimoto & Macias, 2009; Youn & Kim, 2019). For instance, Li et al. (2002) discover that ad intrusiveness is a pivotal factor contributing to viewers' annoyance, potentially reducing viewers' time spent watching advertisements and strengthening their behavioral intentions to close pop-up ads. In a similar vein, research on social media advertising suggests that invasive advertising can yield unintended consequences, including negative attitudes toward ads and reduced behavioral intention to share ads (Li et al., 2002; Taylor et al., 2011; Young & Quan-Haase, 2013). Overall, these findings support the expectation that when users encounter in-stream video advertising interruptions during their flow experiences, they are likely to experience negative emotions (i.e., anger) and discount the quality of advertising (i.e., negative cognition), ultimately engaging in ad avoidance activities to enhance their overall user experience on Twitch (Cho & Cheon, 2004; McCoy et al., 2008; Youn & Kim, 2019). Given that this research's central aim is to investigate the intricate interplay and causal relationships, the researchers therefore develop the following hypotheses to examine how each reactant sub-component connects to reactance outcomes differently, in conjunction with Youn and Kim's (2019) study (see Figure 1).

H2: Twitch users' perceptions of flow will positively affect their perceptions of (a) negative cognitions, which will positively influence (b) cognitive ad avoidance and (c) behavioral ad avoidance.

H3: Twitch users' perceptions of flow will positively affect their (a) feelings of anger, which will positively influence (b) cognitive ad avoidance and (c) behavioral ad avoidance.

Figure 1. Conceptual Model of Ad Avoidance on Twitch



Method

Using Qualtrics, a web-based survey was administered to investigate the proposed model of ad avoidance on Twitch (see Figure 1). Two hundred and ninety-seven participants were Twitch users from the US who were recruited through the Amazon Mechanical Turk (MTurk) platform. The participants' ages vary from 18 to 68 ($M = 30.91$, $SD = 7.26$), with 67% male and 33% female. The average daily Twitch use time for participants was 84.65 minutes.

After clicking the study link on the MTurk, participants were directed to the consent form in accordance with the Institutional Review Board's approved protocols. Those who agreed to participate completed an online questionnaire designed to gather participants' demographic information and gauge their perceptions of telepresence, flow, reactance, cognitive and behavioral avoidance. After completing the survey, participants received \$0.40 for participation. Approximately, it took 10 minutes for each participant to complete the full procedure.

Measures

Most measure items were adopted from prior studies and revised to fit the context of Twitch and in-stream video ads. The following variables were measured: (a) perceived telepresence, (b) flow, (c) reactance, which included cognitive evaluations and anger, and (d) cognitive and behavioral ad avoidance.

Telepresence

Telepresence was assessed using seven items adopted from Hernandez's study (2011) on a 7-point scale ranging from 1 = *strongly disagree* to 7 = *strongly agree* (e.g. 'I forgot about my immediate surroundings when I watch content on Twitch,' $\alpha = .93$).

Flow

The extent to which each participant experienced flow was measured using a scale developed by Chen and Lin (2018). The 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*) consisted of four items (e.g. "When watching the content on Twitch, I do not realize how time passes," $\alpha = .77$).

Reactance

Psychological reactance was measured with two components, negative cognitions, and anger. To assess users' negative cognitions of the in-stream video advertisements, participants were asked to make a judgment on three items (e.g., "Seeing the in-stream video ads on Twitch was reasonable"), where 1 = *not at all* and 7 = *very much* (reverse coded later for analyses, $\alpha = .86$). These items were adopted and modified from prior

studies (Gardner & Leshner, 2016; Youn & Kim, 2019). Anger was also measured using four items (e.g. “The in-stream video ads on Twitch make me feel annoyed”), where 0 = *none of this feeling* and 7 = *a great deal of this feeling* (Seo & Dillard, 2019; $\alpha = .91$).

Ad Avoidance

Ad avoidance was estimated with cognitive and behavioral ad avoidance. For cognitive ad avoidance, three items were adopted and modified from Youn and Kim’s study (2019) to gauge the concept, users’ tendency to ignore advertising, which ranged from 1 = *strongly disagree* to 7 = *strongly agree* (e.g., “I ignore the in-streaming video ads on Twitch,” $\alpha = .83$). Behavioral ad avoidance was measured using three items (e.g., “I go the extra mile to stay away from the ads on Twitch,” $\alpha = .81$), particularly users’ effect to skip the advertising. Items were measured on a 7-point scale, ranging from 1 = *strongly disagree* to 7 = *strongly agree* (Youn & Kim, 2019).

Results

Measurement Model

A confirmatory factor analysis (CFA) was performed to assess the validity of the measures with AMOS 25. The analysis contained the items to assess telepresence, flow, negative cognitions, anger, cognitive ad avoidance, and behavioral ad avoidance. In the initial test, the result showed a poor model fit: $\chi^2 (237) = 809.68, p < .001$, root mean square error of approximation (RMSEA) = .090, 90% confidence intervals (CIs) = .084 - .097, p of close fit (PCLOSE) = .00, adjusted goodness of fit (AGFI) = .75, comparative fit index (CFI) = .88, and Tucker Lewis index (TLI) = .86. Modification indices suggested three correlations of error terms for the latent construct of telepresence. Two correlations of error terms for anger were also suggested to be correlated. After correlating these five pairs of correlation, the modified model fit was improved to an acceptable level: $\chi^2 (232) = 671.80, p < .001$, RMSEA = .080, 90% CIs = .073 - .087, PCLOSE = .00, AGFI = .79, CFI = .91, and TLI = .89. Although correlating error terms may weaken the validity of the measures because the correlations were only allowed within the same latent constructs, and all items would be collapsed into a single parcel for the following analyses, the correlations should not raise concerns about the integrity of the model.

Structural Model and Hypothesis Testing

To test H1, H2, and H3 in Figure 1, structural equation modeling (SEM) was carried out. First, all variables were generated as single parcels by collapsing items for each latent construct. Then, the error variance of each variable was estimated by multiplying its variance and the value of one minus item alpha reliability (i.e., $[1 - \alpha] \times \sigma^2$; Bollen, 1989). Table 1 shows the means, standard deviations, and correlations among the measured variables.

Table 1. Correlations, Means, and Standard Deviations of the Measured Variables

	Mean	SD	1	2	3	4	5
1. Telepresence	4.22	1.52					
2. Flow	4.63	1.22	.69***				
3. Negative Cognitions	3.94	1.50	.31***	.26***			
4. Anger	4.35	1.69	.13*	.18**	-.33***		
5. Cognitive Avoidance	5.08	1.42	.01	.12*	-.19**	.48***	
6. Behavioral Avoidance	4.51	1.58	.24***	.25***	-.17**	.60***	.36***

* $p < .05$, ** $p < .01$, *** $p < .001$.

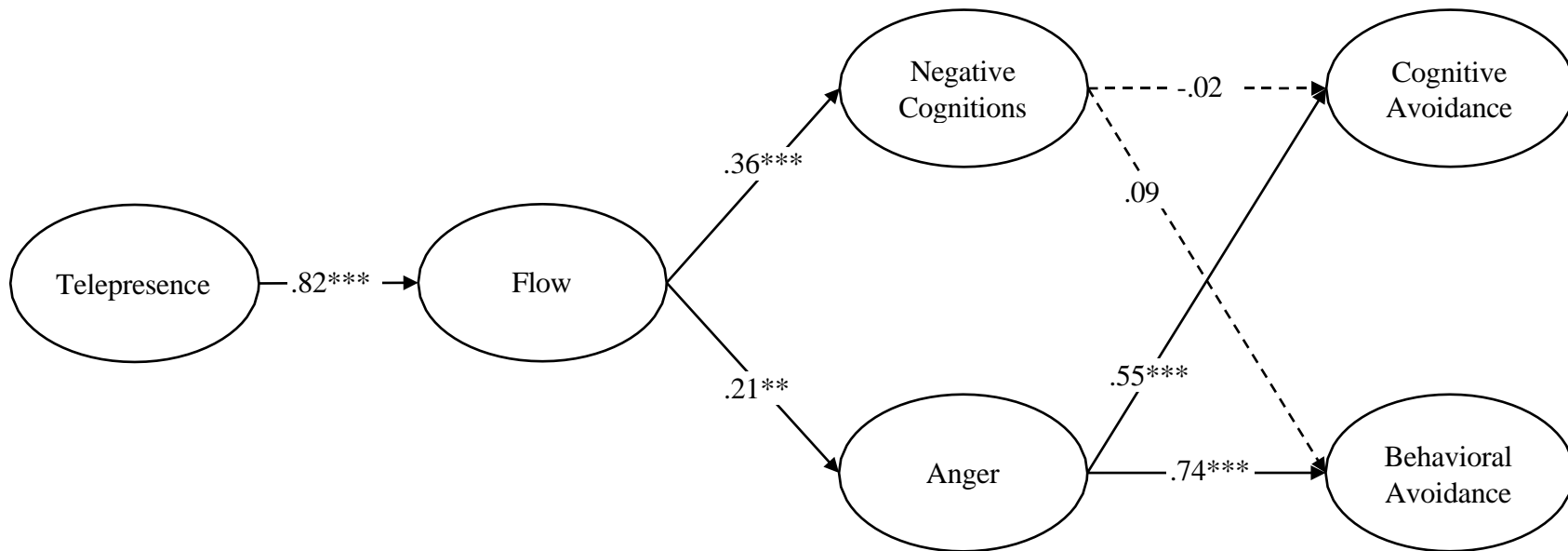
The model was evaluated in terms of model fit and significance of the path coefficients.

The initial test showed a poor model fit: $\chi^2(8) = 78.33, p < .001$, RMSEA = .172, 90% CIs = .139 - .208, PCLOSE = .00, AGFI = .81, CFI = .86, and TLI = .74. The modification indices suggested a correlation of disturbances between negative cognitions and anger. The correlation improved model fit: $\chi^2(7) = 20.72, p < .01$, RMSEA = .081, 90% CIs = .042 - .123, PCLOSE = .09, AGFI = .93, CFI = .97, and TLI = .94. The correlation may raise an issue with the model. However, given that cognition and emotion are greatly intermingled with each other (Frijda, 1986; Lazarus, 1991), and a similar correlation between cognition and emotion has been seen in other studies (e.g., Seo & Dillard, 2019), the correlation should not cause concerns regarding the validity of the model. Figure 2 presents the obtained model of ad avoidance on Twitch with standardized path coefficients. The results are discussed next to the suggested hypotheses.

H1: The Effect of Telepresence on Flow

H1 expected that a higher perception of telepresence would enhance users' flow experience on Twitch. In other words, the degree to which Twitch users sensed telepresence would result in a more intense Twitch flow experience. Consistent with the prediction, the standardized path coefficient ($\beta = .82, p < .001$) of the obtained model in Figure 2 supports the causal relationship between telepresence and flow. Thus, H1 was fully supported.

Figure 2. Obtained Model of Ad Avoidance on Twitch



Note: Path coefficients are standardized weights. Disturbances are correlated between Negative Cognitions and Anger. Dotted lines are nonsignificant paths.
 ** $p < .01$, *** $p < .001$.

H2: The Effect of Flow on (a) Negative Cognitions that Affect (b) Cognitive ad Avoidance and (c) Behavioral Ad Avoidance

H2 predicted that when Twitch users were in a higher flow, they would have (a) more negative cognitions of ad exposure, leading to (b) less attention to ads and (c) an effort to prevent ads. As shown in Figure 2, the path from flow to negative cognitions (H2a) was significant ($\beta = .36, p < .001$), whereas the paths from negative cognitions to cognitive ad avoidance (H2b, $\beta = -.02$) and behavioral ad avoidance (H2c, $\beta = .09$) were not significant. Thus, H2 was partially supported.

H3: The Effect of Flow on (a) Anger that Affects (b) Cognitive Ad Avoidance and (c) Behavioral Ad Avoidance

H3 predicted that when users were in an intense state of flow, they would express (a) strong anger, which would lead to (b) more eagerness to ignore ads and (c) behavioral avoidance of ads. The obtained model in Figure 2 shows that the more flow users experience, the stronger the affective reactance they experience (H3a, $\beta = .21, p < .01$). Furthermore, users' anger increased cognitive ad avoidance (H3b, $\beta = .55, p < .001$) as well as behavioral ad avoidance (H3c, $\beta = .74, p < .001$). Therefore, H3 was completely supported.

Discussion

This study explores 1) whether the interactive environment with media richness on Twitch contributes to users' telepresence and flow status and 2) how users' unique flow experience on Twitch influences their acceptance of in-stream video advertising. First, this study's findings show that users benefit from a highly dynamic interface and rich live-streaming content on Twitch. Previous research on Twitch has shown that co-viewing of live streaming media content and real-time conversation with the streamers and other users significantly impact users' feelings of presence, which may improve their motivations to use Twitch and their flow experiences (Bründl et al., 2017). In conjunction with prior research findings, this study found that Twitch users' telepresence positively correlated to their flow experience. Given that a flow experience positively influences users' attitudes toward the media platform, scholars emphasize the significance of proper website structure and design features in building users' positive feelings (Chen & Lin, 2018; Hernandez, 2011; Wu, 2009). Specifically, Wu (2009) argues that social media platforms should care about users' mental states of flow as an increase in flow can lead to an affinity for the platform and foster more positive attitudes among users. In this point, this study's examination of how users' flow experience is interrelated with their reactance toward ad interruptions contributes new insights to the existing body of knowledge concerning advertising potential within the realm of live-streaming media platforms.

Theoretically, this research highlights a critical insight: in a context where users are already fully immersed, a high level of advertising intrusiveness has the potential to trigger reactance and ad avoidance, possibly undermining users' favorable attitudes

toward the media platform. One reason why Twitch users may not easily tolerate in-stream video advertising interruptions is a loss of control. Flow experience hinges on the crucial factor of control, as it is essential in eliciting a state of flow during a flow encounter. When users have full control and autonomy over their activities and shape their environment within a media platform, they are more likely to appreciate and immerse themselves in the content presented (Johnson & Wiles, 2003; Hernandez, 2011). This happens because the ability to make choices and tailor their experience to personal preferences fosters a sense of ownership and alignment with the content. However, Twitch users often encounter restrictions when confronted with forceful in-stream video advertising interruptions during their self-selected media content consumption. This transition from full control to imposed content can be unpleasant and break a flow state.

Therefore, this rationale helps us understand the significance of maintaining a balance between user control and ad intrusiveness, illuminating the importance of aligning these elements for a seamless and enjoyable user experience on Twitch.

From a broad standpoint, this research finding aligns with the notion that the media platform can provide the context for advertisements (Voorveld et al., 2018). To put it another way, the distinctive experience offered by a specific media platform or the unique interaction the platform enables can profoundly influence how users perceive and embrace embedded advertisements. In the case of Twitch, the significant engagement is real-time interactivity. The Twitch platform encourages users to engage in their activities with its highly interactive features actively, and users develop a sense of control over the platform, allowing them to curate their content exposure. As a result, when the ads disrupt users' flow experience and their goal-oriented activities, users may perceive these interruptions as intrusive and react negatively due to the increased cognitive load, as they need to filter out irrelevant information (Bailey et al., 2001; Cho et al., 2001; Ha, 1996; McCoy et al., 2008). When selecting a media platform for an advertising campaign, the researchers therefore recommend that advertisers thoroughly assess the media platform's features and determine if their advertising messages and formats harmonize with its inherent characteristics. This well-alignment between the media platform and advertising can generate a positive carry-over effect, strengthening the reception of ads posted on the platform and improving users' willingness to accept the ads.

Another main contribution of this project is its examination of how each reactant sub-component interrelates with different ad avoidance activities. One attention-grabbing finding is that anger in reactance leads to strong cognitive and behavioral ad avoidance, whereas negative cognitions in reactance do not appear to have a significant impact on both. This finding supports the premise of PRT that a distinct component of reactance can trigger users' active or passive ways of regaining their independence (Brehm & Brehm, 1981). In the context of Facebook, Youn and Kim (2019) hypothesize that when users perceive newsfeed advertising as intrusive, they feel annoyed (i.e., anger); consequently, they pay less attention to the ads (i.e., cognitive avoidance; passive means) and intend to block the ads (i.e., behavioral avoidance; active means). In a similar vein, when users consider newsfeed advertising intrusive, they deem forced exposure to advertising as unreasonable (i.e., negative cognitions); as a result, they take comparable cognitive and behavioral avoidant

actions to reestablish their independence. The main conclusion from Youn and Kim's study is that anger is a powerful motivator for reactive users to engage in strong avoidant activities. This study's results are consistent with prior research findings that anger responds more sensitively to a threat to freedom than negative cognitions and elicits users' solid intention to regain control over the environment (Kim et al., 2017; Rains, 2013; Youn & Kim, 2019). In the context of reactance, anger often triumphs over negative cognitions in response to advertising features that elicit a persuasive boomerang effect rather than resistance (Kim et al., 2017). Given that in-stream video ads appear in the exact location as the live streams that users want to watch and block them from their goal-oriented goals, it seems plausible to conclude that anger is a driving factor for users to engage in ad-avoidant activities on Twitch. In a similar line, Duff and Faber (2011) demonstrate that consumers who engage in goal-oriented activities experience more intense irritation when they respond to ads that seem similar to media content and are located near the content.

Since ad avoidance implies a breakdown in communication between advertisers and consumers, it is often seen as the most challenging hurdle for advertisers (Fransen et al., 2015; Youn & Kim, 2019). Previous research has discovered that ad placement, ad interruption timing, and the extent of consumer control over ad exposure can significantly influence users' experiences with ad intrusiveness and the degree of forced exposure to advertisements (Ha & McCann, 2008; Li et al., 2002; Ritter & Cho, 2009; Stayman & Aaker, 1988). The advertising intrusiveness is widely acknowledged as a significant factor that triggers negative feelings, which in turn leads to ad avoidance (Edwards et al., 2002; Li et al., 2002). Concerning the role of anger in ad avoidance, Lang (2006) argued that users who have experienced anger have a high ad avoidance tendency in future ad exposure situations in order to prevent experiencing anger again. From a practical perspective, the researchers suggest that a live-stream platform should consider providing an option to close advertising at certain times or to use alternative formats that do not entirely disrupt the live stream (Goldfarb & Tucker, 2011; McCoy et al., 2008). This approach can help reduce users' annoyance and minimize their tendency to avoid ads actively. When users perceive that they can control advertising exposure, the mere presence of this controlling option can even reduce users' perceptions of intrusiveness and negative attitudes toward the ads (Rejón-Guardia & Martínez-López, 2014; Youn & Kim, 2019). Furthermore, offering relevant information that fits users' momentary interests or entertaining information on the ads (Lin & Kim, 2016; Zhu & Chang, 2016) or providing the option to select personally relevant ad content through ad customization features can soften consumers' reactance toward ad intrusiveness (Kim, 2018). To improve users' immersive experience on Twitch, offering various controllable features and allocating ads that fit a specific stream of users' interests are essential.

Finally, an important question that this research does not explicitly address is the non-significant relationship between negative cognitions and ad avoidance. One possible reason for this can be attributed to users' particular mindset towards Twitch. A unique aspect of Twitch's in-stream video ads is the prominent banner explicitly informing that watching these ads would contribute to supporting the streamer. According to Twitch's industry research, users tend to favor supporting

the streamers they like; consequently, they do not mind encountering sponsored ads on Twitch that benefit their favorite streamers. For instance, a survey shows that around 80% of Twitch users are receptive to brand sponsorship for specific streamers and view these sponsorships as beneficial to the business (Clang, 2018). Furthermore, when Twitch users engage in social interaction, exchange real-time information, and enjoy entertainment, they often feel emotional connections with the Twitch platform and specific live-stream communities. This emotional attachment motivates them to support their favorite streamers financially, ensuring they can continue their live streams (Carter & Hoy, 2024; Hilvert-Bruce et al., 2018; Wulf et al., 2021; Yoganathan et al., 2021). In this point, users may perceive the presence of in-stream video advertising as a reasonable or fair trade-off; hence, negative cognitions might not directly lead to ad avoidance. However, advertisers need to approach this possibility cautiously, because users' perceptions of sponsored advertisements may not be consistent across all scenarios, and their willingness to embrace ads could be influenced by factors beyond the contextual aspect.

Considering the nature of sponsorship ads on Twitch, it is important to highlight that these ads often come bundled with numerous compelling messages. Consequently, the abundance of information in advertising can add a cognitive burden on users, requiring them to invest mental effort in filtering through content they deem irrelevant to their interests. To address this challenge, the researchers recommend that web operators consider limiting the number of ads to stay within a "tolerance threshold" (Lin & Kim, 2016; Young & Quan-Haase, 2013). When users are exposed to excessive information or compelled to exert substantial mental effort to filter out ad content, it can result in a negative user experience and foster a negative perception of the platform. Of late, Twitch announced branded content guidelines for on-platform sponsorships, including paid product placement, endorsements, and any forms of sponsored advertisement. From now on, advertisers are required to use Twitch's branded content disclosure tool to ensure that content meets the platform's formatting requirements to improve how advertisements and promotions are displayed on the platform (Twitch Ads, 2023). Furthermore, the Twitch platform offers advertisers a range of choices, including brand integrations, brand partnerships, and sponsorship stream display ads that do not distract users' attention away from their goal-directed status (Twitch Ads, 2023). This strategic shift reflects the potential disruption and annoyance frequent sponsorship ads can cause viewers and the intention to foster a more viewer-centric environment. Future research can investigate how these advertising strategies and the number of ad interruptions interact with users' flow experiences, ultimately resulting in the acceptance of both brands and advertisements.

Study Limitations

While the current study adds to our understanding of advertising avoidance on Twitch, several limitations restrict this study. First, the researchers used the Amazon MTurk sample, in which people choose research projects voluntarily. To reduce the sampling bias, future studies can empirically test the relationship between variables

using larger representative samples (e.g., surveying real Twitch users during a live stream) to confidently generalize the findings. In the context of Twitch, the researchers also examined the role of flow on reactance without measuring users' perceived ad intrusiveness. This measurement parsimony stems from the researchers' judgment that the format of in-stream advertising contains sufficient characteristics to limit users' exposure to the content. Given that various circumstances (e.g., poor ad execution and ad clutter) can create users' perceived intrusiveness (Smith, 2011), measuring perceived intrusiveness can help clarify the main factors shaping users' psychological reactance. Furthermore, the researchers only looked at the influence of in-stream video ads on psychological reactance. Prior reactance research discovered that an individual's difference (e.g., trait resistance), message features (e.g., message framing, loss vs. gain), and advertising formats might be interrelated with a psychological reactance (Dillard & Shen, 2005; Quick & Stephenson, 2008). Therefore, it would be noteworthy to examine how individual differences or message features moderate the effect of flow on reactance, as well as what advertising formats are influential in a particular condition.

Conclusion

Twitch represents a significant transformation in live TV, showing the future of interactive and immersive content consumption. This shift is evident that Twitch users on live-streaming platforms exhibit high engagement with media content and live interactions with the community, although the engagement in ad content could not be consistently as strong.

Therefore, the challenge lies in seamlessly integrating ads on this platform and ensuring that the positive user experience extends to the ads displayed on Twitch. It is widely recognized that when a media platform aligns with the preferences of its users, it not only enhances its perceived value but also strengthens user intention to revisit the platform (Liang et al., 2009). Therefore, this study's findings suggest the importance of carefully balancing advertising exposure and the immersive user experience on live-streaming media platforms. Notably, by tailoring advertising strategies to match the platform's primary user engagements, advertisers can enhance both the platform's value and the reception of the advertisement. With this understanding in hand, advertisers can make informed decisions about advertising formats and execution styles, fostering a profound and optimal user experience. This strategic approach holds the key to unlocking the full advertising potential of dynamic live-streaming platforms, guiding a new era of advertising in the live TV landscape.

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