Twitch Advertising and Purchase Intention: The Impact of In-Stream Ads on Viewer Behavior

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ABSTRACT: Twitch, a leading livestreaming platform in the D-A-CH region, combined real-time content with a highly interactive community, offering unique opportunities for digital marketing. Research on advertising effectiveness at the individual viewer level, however, remained limited. This study investigated how in-stream video and display ads influenced Twitch viewers' purchase intentions and explored the role of ad-related and content-related factors. A survey of 204 Twitch viewers, recruited via Twitch and Reddit, assessed awareness, attitudes, and perceived effects of video and display ads, along with factors such as thematic congruence, entertainment, informativeness, and personalization. Video ads were more effective than display ads in increasing purchase intentions but were perceived as more intrusive. Across formats, thematic alignment with livestream content and content qualities such as entertainment value, informativeness, and personalization significantly enhanced ad effectiveness. The findings highlighted that both ad format and content-related factors were critical for the effectiveness of Twitch advertising. The study advanced theoretical understanding of livestream advertising by emphasizing the interplay between ad characteristics and content context and provided practical guidance for marketers to design engaging, congruent, and less intrusive campaigns.

KEYWORDS: Twitch; livestream advertising; in-stream ads; video ads; display ads; purchase intention

1. Introduction

Livestreaming platforms transformed digital communication by enabling real-time, user-generated content and interactive engagement between streamers and audiences through live chat. This combination of content creation and social interaction fostered highly engaged online communities, where users shared experiences, provided feedback, and made product recommendations [1–3]. Among these platforms, Twitch emerged as a global leader, attracting 35 million daily visitors and generating 61.7 million daily watched hours [4–6]. While initially focused on gaming, Twitch increasingly hosted diverse lifestyle content, including music, art, and food, with non-gaming categories such as "Just Chatting" accounting for 2.68 billion streamed hours in 2023 [7–9]. Despite the platform's popularity, research on marketing in livestreaming contexts remained limited. Existing studies focused primarily on influencer

collaborations [10], branded content effectiveness [11], or product placement in specific sectors [1, 12]. Twitch users generally perceived advertising more positively than on other platforms like YouTube, viewing ads as supportive of content creators rather than solely profit-driven [12]. However, the impact of in-stream video and display ads (hereafter referred to as video and display ads) on purchase intention, a key predictor of consumer behavior [13–15], remained unexplored. Research from other digital contexts suggested that video ads generated higher engagement and ROI than display ads [16–18], while display ads effectively guided users through the purchase funnel [19, 20]. Understanding their effects on Twitch viewers' purchase intention was therefore crucial for both theory and practice.

Twitch served a diverse, global audience, particularly among 18–34-year-olds, with users from 230 nationalities and content in 35 languages [21–23]. From 2015 to 2023, Twitch experienced substantial growth: unique monthly visitors rose from 55 million to 240 million, average concurrent viewers increased to 2.45 million, and monthly streamers reached 7.3 million, with total annual watch time exceeding 1.286 billion minutes [4, 6]. Viewer motivations included entertainment, education, and social interaction, with active participation fostering community formation and engagement [24, 25]. Streamer popularity often outweighed content in attracting viewers, and distinct audience segments preferred either small, interactive streams or large, entertainment-focused broadcasts [25–27]. Many viewers actively participated in community interactions, fostering trust and engagement that brands could leverage for marketing [12, 28, 29]. Viewers were also receptive to advertising, often linking purchases to a sense of community belonging [30]. While influencer marketing received most scholarly attention [10, 12], in-stream ads remained underexamined despite their potential for high visibility and engagement, as demonstrated on comparable platforms [16, 17, 31, 32]. Building on this, the present study investigated the following research question:

How did in-stream (video and display) advertisements on Twitch influence viewers' purchase intention in the D-A-CH region?

The study addressed three objectives: (1) descriptively, to examine viewers' attitudes and perceptions toward in-stream ads; (2) analytically, to quantify the effects of video and display ads on purchase intention; and (3) prescriptively, to provide actionable recommendations for advertisers aiming to optimize marketing strategies on Twitch.

2. Materials and Methods

2.1. Theoretical background of twitch and platform structure.

Twitch was a freely accessible livestreaming platform that allowed users to produce and broadcast content in real time to a global audience [12, 26]. This form of user-generated livestreaming enabled social engagement through integrated chat functions, combining audio-visual content with text-based interaction [11, 25]. Twitch supported streaming across multiple devices, including PCs, consoles, and mobile devices, and provided features such as subscriptions, donations, and community engagement tools [9]. Users could act as both content consumers (viewers) and content creators (streamers) [33]. Twitch's live, interactive environment encouraged two-way communication and participatory viewing, increasing immersion and user engagement compared to conventional social media platforms [34–36].

Influencers, including streamers, served as key network nodes, shaping community behavior and acting as opinion leaders [37].

A Twitch livestream typically consisted of a main video stream window and a live chat panel [38]. The video stream often incorporated a webcam overlay of the streamer, allowing viewers to observe real-time behavior and reactions. The chat enabled immediate text-based interaction and supported emojis or text-to-speech functionality [39]. This structure fostered participatory engagement, creating a sense of presence and community among viewers [34]. Twitch offered multiple advertising formats (Table 1), categorized as page-based ads and in-stream ads. Page-based ads included homepage Headliners, Carousels, Medium Rectangles, and Super Leaderboards, while in-stream ads comprised Twitch Premium Video, Display Ads, and Streamables [38, 40]. Streamers in the Affiliate and Partner programs could schedule ads via Twitch Ad Manager but could not select which ads were displayed, as this was managed by Twitch [41]. Ads were delivered primarily to non-subscribers or users without Twitch Turbo subscriptions [21]. Streamers acted as influencers through sponsored partnerships, promoting products or services directly to their communities, with 64% of viewers reporting that they followed streamer recommendations [10, 21]. Branded content merged storytelling with commercial objectives, leveraging Twitch's entertainment-oriented format to create emotional connections between viewers and brands [11].

Table 1. Twitch advertising formats and potential influence on purchase intention.

Advertising Format	Format Characteristics	Expected Internal Response and Behavioral Outcome
Twitch Premium Video Ads (Pre-/Mid-Roll)	Integrated directly into the livestream; 30–60 seconds; non-skippable; full-screen exposure	High perceived intrusiveness due to interruption of viewing; strong affective engagement and attention; high potential impact on purchase intention depending on viewer attitude, content quality, and thematic congruence
Display Ads - Lower-Third	Horizontal banner below the video stream; approx. 15 seconds; clickable; stream continues	Low perceived intrusiveness; moderate cognitive processing through persistent visibility; medium impact on purchase intention driven by exposure, relevance, and personalization
Display Ads - Skyscraper	Vertical placement between video stream and chat window; approx. 15 seconds; clickable	Low perceived intrusiveness combined with high visual salience; moderate to high interaction potential; medium impact on purchase intention
Streamables	Overlay-based promotion of streamer content or affiliated products; variable duration	Low intrusiveness; indirect internal response via parasocial interaction and streamer endorsement; moderate indirect effect on purchase intention
Page-Based Ads (Homepage / Browsing)	Static or rotating placements (e.g., headliners, carousels, leaderboards); exposure before stream entry	No interruption of viewing; limited affective engagement; low direct impact on purchase intention; primarily supports brand awareness

Video marketing was a highly effective digital marketing tool, capable of capturing attention, conveying complex information, and eliciting emotional responses that drove purchase intention [18, 32, 42, 43]. Twitch Premium Video ads were integrated into livestreams as pre-roll or mid-roll placements, were non-skippable, and lasted 30–60 seconds [21, 44]. Display ads combined text and graphics with clickable links and remained among the most widely used digital advertising formats globally [45, 46]. Twitch Display Ads included lower-thirds beneath the video stream and skyscrapers positioned between the video and chat window [21, 47]. These ads maintained visibility without disrupting the viewing experience, providing continuous brand exposure while allowing viewers to engage fully with the livestream.

2.2. Development of the research model and hypotheses.

Research indicated that Twitch viewers generally exhibited tolerance toward advertising content and tended to respond positively. Lyubomir [14, 28] noted that viewers perceived advertisements as a means of supporting content creators, which in turn fostered favorable attitudes toward advertising. Empirical data from Twitch [21, 22] corroborated this observation, showing that 56% of viewers were likely to purchase brands they had encountered in ads on the platform. Furthermore, Pollack et al. [12] reported that 79% of viewers perceived Twitch ads as supportive of content creators, whereas only 40% reported experiencing negative emotions when exposed to advertising. The Stimulus-Organism-Response (SOR) model [48] provided a useful framework for understanding these dynamics. According to this model, an external stimulus, such as an advertisement, triggered internal processes within the organism—attitudes, perceptions, emotions, and motivations—which subsequently influenced behavioral responses [49, 50]. Applied to Twitch livestream advertising, the advertisement served as the stimulus, eliciting positive attitudes and affective responses in viewers, which in turn were expected to increase purchase intentions (H1).

Beyond attitude, ad placement within livestreams also affected purchase intentions by influencing perceived intrusiveness. Mid-roll video ads achieved the highest completion rates (97%) compared to pre-roll ads (74%), likely due to higher engagement during content consumption [51], and also produced stronger effects on brand recall and attitude [52]. For display advertising, lower-third placements attracted viewer attention at least once for 97% of viewers, while vertical skyscraper ads outperformed horizontal lower-thirds in interaction and click-through rates [53, 54]. However, the interruptive nature of in-stream advertising could act as a negative stimulus, generating adverse internal reactions such as frustration or irritation, which could reduce purchase intention. Consistent with SOR and advertising intrusiveness theory, it was proposed that perceived intrusiveness of pre-roll and mid-roll video ads (H2a and H2b) as well as lower-third and skyscraper display ads (H3a and H3b) diminished viewers' likelihood of purchase. Advertising effectiveness was further enhanced when ads were integrated into thematically congruent contexts. Congruity theory suggested that stimuli aligned with surrounding content were processed more fluently and favorably, eliciting stronger internal responses and increasing purchase intention [55–57]. Consequently, video and display ads that matched the thematic content of Twitch livestreams were expected to increase viewers' purchase intentions by enhancing cognitive processing and positive affective responses (H4 and H5).

Content characteristics also played a critical role in influencing purchase intention. According to the AIDA model [58], advertisements guided viewers through the stages of Attention, Interest, Desire, and Action, each corresponding to internal cognitive and affective processes leading to behavioral outcomes. Entertaining video ads captured attention through humor, storytelling, or visually engaging elements, sustained interest, and elicited positive emotions, thereby strengthening brand associations and purchase intention (H6). Informative video ads provided utilitarian value by delivering relevant product information or unique selling propositions, which increased perceived usefulness, reduced uncertainty, and facilitated cognitive evaluation (H7). Entertainment and informativeness therefore enhanced purchase intention through complementary mechanisms: entertainment promoted affective engagement, while informative content supported cognitive evaluation.

Finally, personalized display advertising leveraged viewer-specific data such as game preferences, past viewing history, or interaction patterns to increase relevance and perceived value. Personalization and relevance theories suggested that tailored stimuli were more likely to be deeply processed, reduced perceived intrusiveness, and fostered engagement, thereby enhancing purchase intention (H8) [48–50, 59, 60]. Personalized ads provided viewers with content that aligned with individual interests, creating a sense of individualized relevance that strengthened the link between stimulus, internal processing, and behavioral response. This theoretical framework suggested that positive attitudes toward Twitch ads, strategic ad placement, thematic congruence, entertaining or informative content, and personalization all contributed to increased purchase intention. By integrating the SOR model, AIDA framework, congruity theory, and personalization principles, it became possible to explain how different aspects of Twitch in-stream advertising influenced both cognitive and affective internal processes, ultimately shaping consumer behavior in livestream environments.

H1: A positive attitude toward Twitch in-stream advertising increases viewers' purchase intention (SOR Model)

H2a: The perceived intrusiveness of pre-roll video ads reduces the likelihood of purchase (SOR Model + Advertising Intrusiveness Theory)

H2b: The perceived intrusiveness of mid-roll video ads reduces the likelihood of purchase (SOR Model + Advertising Intrusiveness Theory)

H3a: The perceived intrusiveness of lower-third display ads reduces the likelihood of purchase (SOR Model + Advertising Intrusiveness Theory)

H3b: The perceived intrusiveness of skyscraper display ads reduces the likelihood of purchase (SOR Model + Advertising Intrusiveness Theory)

H4: The thematic congruence of video ads (pre-roll or mid-roll) with Twitch livestream content increases viewers' purchase intention (SOR Model + Congruity Theory)

H5: The thematic congruence of in-stream display ads (lower-third or skyscraper) with Twitch livestream content increases viewers' purchase intention (SOR Model + Congruity Theory)

H6: Entertaining video ads on Twitch increase viewers' purchase intention (SOR Model + AIDA Framework)

H7: Informative video ads on Twitch increase viewers' purchase intention (SOR Model + AIDA Framework)

H8: Personalized display ads increase viewers' purchase intention (SOR Model + Personalization/Relevance Theory)
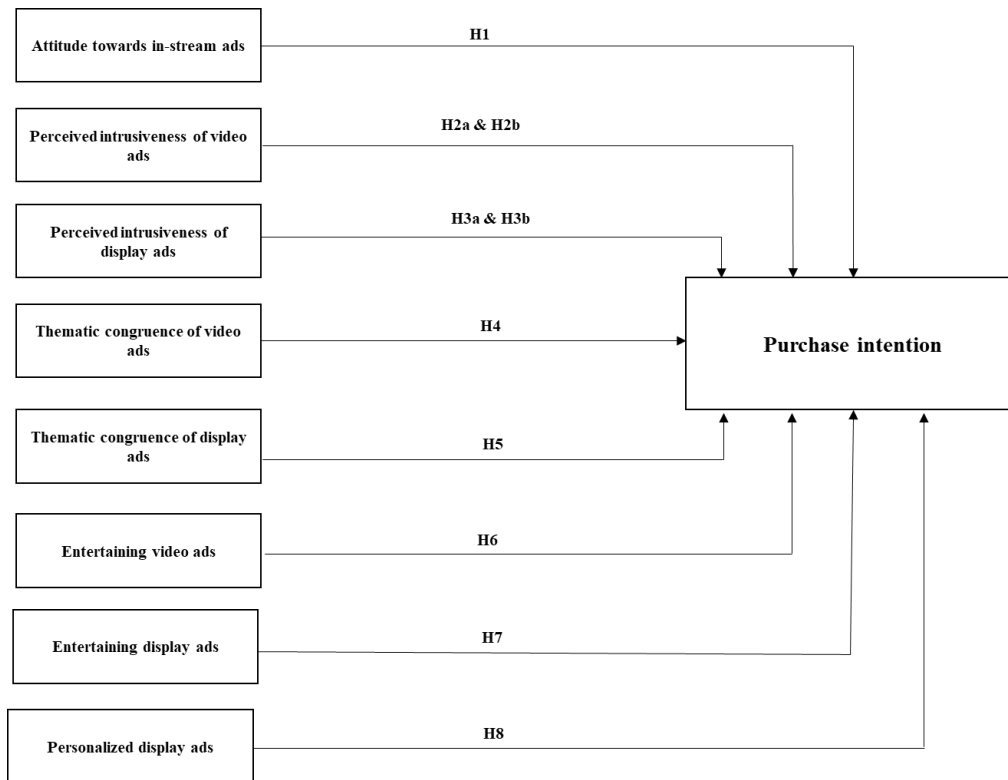
Figure 1. Conceptual model of twitch in-stream ads and purchase intention.

2.3. Research design and procedure.

This study employed a quantitative research methodology with an explanatory purpose to answer the research question. This approach was selected to evaluate the correlation between the independent variable (video and display ads) and the dependent variable (viewers' purchase intention). The research was grounded in a positivist philosophy and followed a deductive approach to examine the relationship between these variables [61]. A quantitative methodology was deemed most appropriate, as the primary objectives were to ascertain viewers' general attitudes and perceptions toward in-stream ads and to evaluate the influence of these ad formats on purchase intention. This approach facilitated efficient data collection from a large audience using identical questions. Consequently, hypotheses were derived from extant literature and tested by collecting numerical data through a structured online questionnaire. Given that the research investigated advertising effects at a specific point in time, a cross-sectional design was adopted [61].

2.4. Sampling strategy.

The target population comprised Twitch users residing in Germany, Austria, and Switzerland (the D-A-CH region), defined as individuals familiar with the platform who used it regularly. The combined Twitch user population for these countries was approximately 16.85 million. A non-probability sampling approach was employed due to the absence of a comprehensive sampling frame [61, 62]. Convenience sampling was used for its cost-effectiveness and accessibility, with the survey distributed across social media platforms. To enhance reliability, a homogeneous sampling approach restricted the population to individuals defined by Twitch usage and D-A-CH residency [62]. Twelve participants unfamiliar with Twitch and nine with

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uniform responses across all items were excluded, yielding a final cleaned dataset of 204 participants. The sample was predominantly male (62.3%), with females at 36.3% and non-binary participants at 1.4%. Age distribution was youth-oriented: 57.8% aged 13–27 years, 38.2% aged 28–43 years, and a small proportion in older groups. Geographically, 82.4% were from Germany, 11.3% from Austria, and 6.4% from Switzerland.

2.5. Questionnaire design and measurement scales.

The questionnaire, developed in German using the LamaPoll survey tool, began with informed consent and an introductory page and included 37 questions with examples and visuals for clarity. Sections covered user behavior (e.g., Twitch usage frequency and session duration), general advertising perception, and core measures of purchase intention, perceived ad intrusiveness, thematic congruence, and attitude toward Twitch ads, followed by demographics. Participants were screened for Twitch familiarity via a usage-frequency question. Measurement scales were adapted from established instruments, mostly using five-point Likert scales. Purchase intention was measured with eleven items on a four-point scale (1 = very likely to 4 = very unlikely) and one item assessing agreement (1 = strongly agree to 4 = strongly disagree) [63]. Perceived intrusiveness was measured with seven items on a four-point scale (1 = extremely to 4 = not at all) [64], and attitude toward advertising with three items on a four-point scale [65]. A four-point scale was chosen to avoid neutral responses, encouraging clear positive or negative evaluations [66, 67].

2.6. Data collection and quality criteria.

A pretest conducted on 1 May 2024 with seven participants (Germany n=3, Austria n=2, Switzerland n=2; women n=3, men n=4) assessed clarity, comprehensibility, structure, and suitability. Feedback led to corrections of spelling, refinement of ambiguous questions, removal of low-quality items, and adaptation of example images. Data were collected from 3–29 May 2024 via hyperlinks distributed on Facebook, Instagram, LinkedIn, X (Twitter), Reddit, and Twitch, targeting German-speaking Twitch groups, live chats, and relevant subreddits (e.g., r/TwitchGerman, r/LivestreamFails, r/Twitch). Reliability and validity were ensured through pretesting, internal consistency checks (Cronbach's Alpha), and systematic data cleaning in IBM SPSS Statistics Version 29.0.2.0. Initial screening corrected inconsistencies in labeling, coding, and measurement scales, followed by automated and manual checks to minimize errors.

3. Results and Discussion

3.1. Descriptive results.

3.1.1. Behavioral engagement.

Participants exhibited diverse engagement patterns on Twitch. Most accessed the platform infrequently or moderately: 37.3% reported using Twitch 1-2 times per week, 35.8% less than once per week, 18.6% 3-5 times per week, and 8.3% daily. Session durations were generally brief, with 43.1% viewing under one hour, 40.2% for 1-2 hours, and 16.7% for more than two hours. Usage frequency and session duration were systematically related: daily users primarily engaged in sessions longer than two hours (70.6%), frequent users (3-5 times/week) typically

viewe,d 1-2 hours (57.9%), moderate users (1-2 times/week) showed mixed patterns (56.6% 1-2 hours), and infrequent users (<1 time/week) mainly watched under one hour (82.2%). These patterns highlight a clear link between platform commitment and engagement intensity, which provides important context for interpreting advertising effectiveness.

3.1.2.Advertising awareness.

Overall, 54% of participants reported conscious awareness of in-stream ads, with a mean awareness score of 2.42 (SD = 0.925), indicating moderate perceptual salience. Awareness increased with both usage frequency and session duration: heavy users (3-5 times/week) exhibited the highest recognition (23.7% strong awareness; no non-perception), moderate users (1-2 times/week) showed 71.1% awareness, and infrequent users (<1 time/week) were lowest at 28.8%. Peak awareness occurred among viewers of 1-2 hour sessions (68.3%), while brief sessions yielded limited recognition (38.6%), and extended sessions (>2 hours) resulted in moderate awareness (61.8%). Males (62.2%) and users aged 28-43 (64.1%) displayed slightly higher awareness than females (40.5%) and younger users (47.5%), suggesting that demographics contribute to perceptual recognition.

3.1.3. Attitudes toward in-stream ads.

Attitudinal responses were predominantly negative, with 78.4% of participants disagreeing or strongly disagreeing with positive statements (M = 3.08, SD = 0.78). Infrequent users (<1 time/week) showed the strongest negativity (93.2%), whereas moderate users (1-5 times/week) displayed relatively more positive orientations, particularly in the 3-5 times/week bracket (47.4%). Daily users exhibited limited negativity, suggesting habituation effects. Session duration moderated attitudes: 1-2 hour viewers showed the highest acceptance (24.4% positive), brief sessions correlated with pronounced negativity (93.2% negative), and extended sessions (>2 hours) elicited more polarized responses. Video ads were evaluated more negatively (M = 3.17, SD = 0.719; 85.3% negative) than display ads (M = 3.04, SD = 0.758; 81.4% negative), with mid-roll video placements and lower-third display ads slightly better received than pre-rolls and skyscrapers.

3.1.4.Purchase intention.

Overall purchase intention was moderate (M = 2.96, SD = 0.906), with 34.3% indicating likely or very likely purchasing behavior. Moderate users (1-5 times/week) reported the highest intentions (34.2-36.8%), infrequent users (<1 time/week) the lowest (8.2%), and daily users showed minimal responsiveness. Session duration again moderated responses: 1-2 hour sessions correlated with peak intention (41.5%), brief sessions yielded low intention (15.9%), and extended sessions were moderate (35.3%). Gender differences favored males (33.1%) over females (20.3%), while age effects were negligible. Among content attributes, entertainment value was most influential (81.3% positive; 38.2% strongly agreeing), followed by personalization (76.5%) and informativeness (76.0%). Video ads generated higher purchase intention (24.0%) than display ads (16.7%), despite greater perceived intrusiveness. Mid-roll video ads outperformed pre-rolls (17.6% vs. 14.7%), and lower-third display ads captured

attention more effectively (72.5%) than skyscrapers (27.5%), highlighting the role of visual integration and placement in shaping ad effectiveness.

3.2. Hypothesis testing.

The inferential statistical analysis aimed to determine the influence of various psychological and perceptual factors on Twitch viewers' purchase intention in response to different in-stream ad formats. The investigation focused on the relationships between attitude, perceived intrusiveness, thematic congruence, entertainment, informativeness, and personalization with the dependent variable - purchase intention. Through a series of linear regression analyses, this section provides quantitative evidence for the predictive power of each independent variable and the statistical significance of their effects. The first regression model tested the hypothesis that a positive attitude toward in-stream ads enhances purchase intention. Results confirmed a moderate positive relationship ($R = 0.535$, $R^2 = 0.286$, $p < 0.001$), indicating that approximately 28.6% of the variance in purchase intention could be explained by viewers' attitudes. The regression coefficient ($B = 0.524$) was positive and significant, confirming that as attitudes become more favorable, viewers exhibit higher purchase intentions. This finding supports H1, demonstrating that positive affective evaluations of in-stream ads serve as a crucial determinant of advertising effectiveness on Twitch.

The next group of hypotheses (H2a–H3b) explored how the perceived intrusiveness of different ad placements - pre-roll, mid-roll, lower-third, and skyscraper - affects purchase intention. For pre-roll ads (H2a), the analysis revealed a low positive correlation ($R = 0.228$, $R^2 = 0.052$, $p < 0.001$) but a significant negative coefficient ($B = -0.206$, $p < 0.001$). This indicates that higher perceived intrusiveness significantly reduces purchase intention. Similarly, mid-roll ads (H2b) exhibited a comparable pattern ($R = 0.250$, $R^2 = 0.063$, $B = -0.207$, $p < 0.001$), reinforcing the finding that intrusive interruptions during live content undermine consumer receptivity. For lower-third ads (H3a), results demonstrated a low but significant negative effect ($R = 0.167$, $R^2 = 0.028$, $B = -0.157$, $p = 0.017$), confirming that intrusiveness in this visual overlay format also diminishes purchase likelihood. However, skyscraper ads (H3b) - typically placed on the screen periphery - did not yield significant results ($R = 0.054$, $p = 0.447$), indicating that viewers largely ignore these placements or perceive them as non-disruptive. Overall, the results show that ad intrusiveness negatively affects purchase intention, particularly when ads interrupt the flow of live content, confirming H2a, H2b, and H3a, while H3b was not supported.

Hypotheses H4 and H5 examined whether thematic congruence - the alignment between ad content and the livestream context - influences purchase intention. For video in-stream ads (H4), results demonstrated a moderate positive relationship ($R = 0.466$, $R^2 = 0.217$, $p < 0.001$; $B = 0.472$), suggesting that when ads match the themes of the livestream (e.g., gaming-related ads during gaming streams), they significantly enhance viewers' purchase intention. This highlights the importance of contextual fit in advertising effectiveness. Similarly, display in-stream ads (H5) showed a moderate positive relationship ($R = 0.361$, $R^2 = 0.130$, $p < 0.001$; $B = 0.344$). Although slightly weaker than the video format, this finding indicates that congruence in both visual and thematic aspects improves consumer receptivity and ad persuasiveness. Together, these results strongly support the argument that contextually aligned advertising enhances cognitive and emotional engagement, thereby fostering higher purchase intentions.

The analysis for H6 tested whether entertaining video ads lead to greater purchase intention. Findings revealed a weak yet significant positive relationship ($R = 0.172$, $R^2 = 0.030$, $p = 0.014$; $B = 0.125$). Although the variance explained (3%) is limited, the significance of the coefficient indicates that entertainment contributes to ad effectiveness by enhancing affective engagement and reducing ad avoidance. Viewers who perceive ads as enjoyable or humorous are more likely to develop a favorable disposition toward the promoted product. Thus, while entertainment plays a supportive rather than dominant role, it still serves as a positive predictor of purchase intention, confirming H6.

Hypothesis H7 examined whether informative content in video ads increases purchase intention. Regression analysis yielded a weak but significant positive effect ($R = 0.229$, $R^2 = 0.052$, $p < 0.001$; $B = 0.173$). This suggests that ads perceived as providing relevant or useful product information enhance viewers' willingness to consider purchasing. While the explained variance is small (5.2%), the consistent statistical significance underscores that informativeness remains a key cognitive factor in ad evaluation, aligning with established advertising theories such as the Elaboration Likelihood Model (ELM), where information quality influences central route processing.

The final hypothesis (H8) assessed the impact of personalized display ads on purchase intention. Results revealed a weak yet statistically significant positive relationship ($R = 0.212$, $R^2 = 0.045$, $p = 0.002$; $B = 0.154$). With strong internal consistency (Cronbach's $\alpha = .856$), the findings confirm that personalized ads - tailored to viewers' interests or behaviors - positively influence their likelihood to purchase. This supports the notion that personalization enhances relevance and reduces cognitive resistance, even in environments characterized by high advertising saturation. Thus, H8 was confirmed, although the effect size was modest. The regression analyses across all models, as presented in Table 2, provide a coherent understanding of how different ad-related factors influence Twitch users' purchase intentions:

- Positive attitudes and thematic congruence were identified as the strongest predictors, explaining a substantial portion of the variance (21–29%).
- Perceived intrusiveness, particularly for pre-roll and mid-roll ad formats, consistently reduced purchase intention, highlighting the negative impact of interruptive ads on user experience.
- Entertainment, informativeness, and personalization exerted weaker yet statistically significant effects, suggesting that enhancing ad quality and aligning content with user preferences can incrementally improve advertising effectiveness, even in an entertainment-driven platform.

These results collectively suggest that Twitch advertising effectiveness depends on the balance between engagement and intrusion. Ads that integrate seamlessly into the viewing experience - through thematic alignment, engaging presentation, or personal relevance - enhance persuasion, while intrusive or irrelevant formats undermine user receptivity.

Table 2. Outcome hypothesis testing

Hypothesis	Variable	Direction	Significance	Supported
H1	Attitude – Purchase Intention	+	p < 0.001	✓
H2a	Pre-roll Intrusiveness – Purchase Intention	-	p < 0.001	✓
H2b	Mid-roll Intrusiveness – Purchase Intention	-	p < 0.001	✓
H3a	Lower-third Intrusiveness – Purchase Intention	-	p = 0.017	✓
H3b	Skyscraper Intrusiveness – Purchase Intention	+	p = 0.447	X
H4	Thematic Congruence (Video) – Purchase Intention	+	p < 0.001	✓
H5	Thematic Congruence (Display) – Purchase Intention	+	p < 0.001	✓
H6	Entertainment – Purchase Intention	+	p = 0.014	✓
H7	Informativeness – Purchase Intention	+	p < 0.001	✓
H8	Personalization – Purchase Intention	+	p = 0.002	✓

3.3. Discussion.

3.3.1. Theoretical contributions.

This study investigated how Twitch in-stream ad formats influenced viewers' purchase intentions in the D-A-CH region, addressing a gap in empirical research on livestreaming-based advertising effectiveness. The research focused on attitudes, perceptions, and behavioral intentions toward video and display ads. While previous studies indicated generally positive viewer attitudes toward in-stream ads [12, 28], this study revealed a more nuanced and predominantly negative sentiment. A total of 78.5% of respondents expressed disagreement with having a positive attitude toward in-stream ads, citing intrusiveness and disruption as key factors. Despite this, over half of the participants consciously perceived such ads, demonstrating high awareness even amid critical attitudes. Slightly more favorable responses were recorded for display ads compared to video ads, likely due to their non-interruptive format and lower intrusiveness [16]. However, this marginal advantage did not translate into stronger purchase intentions. In contrast, video ads, despite their higher intrusiveness, prompted greater purchase consideration, highlighting their attention-capturing potential and immersive nature, supporting H1 and the SOR model.

The study confirmed theoretical assumptions of SOR, showing that positive attitudes toward ads significantly increased purchase intention (H1) across both ad types and most placements, except skyscraper ads. Results regarding ad intrusiveness confirmed H2, with pre- and mid-roll ads perceived as most disruptive and correlating with lower purchase intention, while lower-third and skyscraper formats, being less intrusive, showed reduced behavioral impact, consistent with banner blindness theory [68]. Thematic congruence supported H3, as ads aligned with livestream content yielded higher purchase probabilities, with viewers reporting a 43.1% likelihood of purchase when the ad matched the theme. Video ads

demonstrated slightly stronger effects, reinforcing the notion that contextual relevance enhanced cognitive and emotional engagement [56]. Regarding content-driven predictors, H4 was confirmed: entertainment, informativeness, and personalization increased purchase intention, consistent with the AIDA model. Entertaining and informative video ads were endorsed by 81.3% and 76% of participants, respectively, while personalized display ads led 76.5% of respondents to higher purchase consideration.

3.3.2. Managerial contributions.

The findings offer actionable insights for advertisers and digital marketing professionals using Twitch. First, marketers should not assume a universally positive attitude toward in-stream ads. The prevalent perception of intrusiveness highlights the need to minimize disruption and enhance contextual fit. Pre-roll ads, often deemed highly intrusive, should be limited in favor of integrated placements such as mid-roll or lower-third ads, which maintain visibility while reducing interference [16, 32, 55, 60]. Second, thematic congruence should guide ad placement and creative strategy, aligning ad messages with livestream content to improve attention, cognitive resonance, and persuasion [56]. Collaborations with streamers whose content and audiences align with brand identity can create authentic, co-produced ad experiences. Third, ad content quality is critical: video ads should combine entertainment and informativeness to reduce intrusiveness and enhance persuasive impact, while display ads should leverage personalization to counter banner blindness [69, 70]. Fourth, a balanced format strategy integrating video and display ads is recommended: video ads capture attention and drive awareness, while display ads reinforce message retention [16, 68]. Finally, advertisers should measure effectiveness beyond traditional metrics, incorporating engagement-based indicators such as chat sentiment, emotional reactions, and viewing retention, to reflect the platform's interactive nature and optimize campaigns [12, 28].

3.3.3. Limitations.

Despite an a priori calculation indicating a sufficient sample size, the final sample comprised 204 participants, representing a methodological limitation that may reduce the study's statistical power. However, sample size requirements for regression analyses depend primarily on model complexity and expected effect sizes [71]. According to Green [72] and Tabachnick and Fidell [73], the achieved sample exceeds the minimum thresholds for testing individual predictors, and prior research suggests that 150–200 observations are sufficient to detect medium-sized effects [71]. Nonetheless, the reduced sample may have limited the detection of small effects, particularly for subtle relationships hypothesized in H2 (ad intrusiveness) and H3 (thematic congruence), increasing the likelihood of Type II errors. Non-significant results should therefore be interpreted cautiously within the SOR framework, as insufficient power may mask weaker organismic or behavioral responses to stimuli. The use of non-probability convenience sampling also constrains generalizability beyond Twitch users in the D-A-CH region. While the relatively homogeneous sample supports internal validity, cultural and platform-specific differences may limit the applicability of findings to other markets. This is particularly relevant for constructs related to attitudinal and emotional responses in SOR and the effectiveness of AIDA-driven content variables (entertainment, informativeness, personalization). Future studies should pursue larger, probabilistic samples and cross-cultural

designs to validate the hypothesized effects. Survey distribution restrictions due to Twitch and Reddit self-promotion policies further limited sample diversity. Alternative recruitment strategies, such as partnerships with streamers or embedded Twitch surveys, could enhance representativeness and allow a more robust test of H1 (attitude → purchase intention), H2, and H4 (content-driven engagement). Finally, the quantitative, self-reported design restricts insight into emotional and contextual nuances of viewer experience. Viewer-ad interactions in a participatory environment like Twitch may be moderated by social dynamics, chat interactions, or community norms, which were not explicitly analyzed. These factors are likely to influence the organismic stage in SOR and may strengthen or weaken behavioral responses beyond the measured cognitive and affective variables. Qualitative or experimental studies would enrich the understanding of these dynamics and provide more nuanced interpretations of intrusiveness, thematic congruence, and engagement-based effects.

3.3.4. Future research directions.

Future research should address the limitations of this study and expand on emerging questions. First, the role of Twitch community dynamics warrants greater attention. Twitch communities are highly interactive and socially cohesive [27], potentially shaping viewers' advertising perceptions through collective norms, peer influence, and parasocial relationships with streamers. Investigating these social dimensions could clarify how community engagement mediates cognitive and affective responses in the SOR framework, influencing purchase intentions and ad effectiveness. Second, comparative analyses across content categories are needed to determine whether in-stream ad effectiveness varies by stream type (e.g., gaming, music, lifestyle). Understanding such distinctions could inform thematic congruence strategies (H3) and allow marketers to tailor placements and messaging to maximize attention, relevance, and persuasion. Third, integrating qualitative and experimental methods can deepen insights into cognitive and emotional processes underlying ad avoidance, engagement, and persuasion. Techniques such as eye-tracking, sentiment analysis, or real-time behavioral observation would provide a richer understanding of how Twitch users process intrusive vs. non-intrusive stimuli, aligning with AIDA-based engagement constructs and organismic reactions in SOR. Finally, as livestreaming evolves technologically and socially, future research should examine emerging ad formats - such as interactive overlays, AI-generated dynamic ads, or influencer-integrated content - and their impact on viewer experience and purchase behavior. Such investigations will bridge traditional advertising theories with the dynamic realities of participatory digital media ecosystems, extending the applicability of SOR, Intrusiveness, Thematic Congruence, and AIDA in contemporary livestreaming contexts.

4. Conclusion

This study examined the effectiveness of Twitch in-stream advertising formats on viewers' purchase intentions in the D-A-CH region, addressing a gap in research on livestream-based advertising in German-speaking markets. Overall, viewers exhibited a predominantly negative attitude toward in-stream ads, with 78.5% perceiving them as intrusive and disruptive, reflecting the region's high advertising scepticism, strong privacy awareness, and preference for informational content over overt persuasion. Despite this, ad awareness remained high, indicating that even negatively perceived stimuli can capture attention. Display ads were rated

slightly more favorably due to lower intrusiveness, but this did not translate into stronger purchase intentions. In contrast, video ads, though more disruptive, generated higher purchase consideration, highlighting their immersive potential. The findings support the Stimulus–Organism–Response model in the livestreaming context, showing that positive attitudes toward advertising significantly increase purchase intentions across most formats. Pre-roll and mid-roll video ads were the most intrusive and negatively affected purchase intention, consistent with low tolerance for interruptive advertising in the D-A-CH market. Less intrusive display formats, such as lower-third and skyscraper ads, suffered from reduced salience, consistent with banner blindness. Thematic congruence was a key driver of effectiveness, with ads matching livestream content significantly increasing purchase likelihood, particularly for video formats. Entertainment, informativeness, and personalization were identified as additional content-related success factors, reaffirming the relevance of the AIDA model in this regional context. From a managerial perspective, advertisers targeting the D-A-CH region should prioritize contextual fit, transparency, and content quality, while avoiding overly intrusive formats. Collaborations with trusted streamers and engagement-based performance metrics can optimize ad effectiveness in this scepticism-prone market. Limitations include the reduced sample size, regional focus, and reliance on self-reported data. Future research should adopt larger, cross-cultural, and mixed-method designs and further investigate the moderating role of Twitch community dynamics across European markets.

Author Contribution

All authors contributed equally to the study design, analysis, and writing. Data collection was performed by Mrs. Judith Eckert.

Conflicts of Interest

The authors declare no conflict of interest.

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