



A STUDY ON THE USE OF YOUTUBE AS AN ADVERTISING PLATFORM IN THE FASHION INDUSTRY, ANALYZING CAMPAIGN STRATEGIES, AUDIENCE TARGETING, AND BRAND ENGAGEMENT METRICS

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ABSTRACT

This study examined the relationships between product type, creative strategy, music and user engagement with consumer technology video ads on YouTube using both content analysis and experiment. The content analysis study (n = 300) found smartphone, software, and IoT were positively associated with number of views whereas music was negatively associated with number of views. Smartphone was positively associated with number of likes whereas music was negatively associated with number of likes. Ego and smartphone were positively associated with number of dislikes whereas printer and sensory were negatively associated with number of dislikes. The subsequent 2 (Product Type: Smartphone vs. Software) x 2 (Music: Absence vs. Presence) x 2 (Ego: Absence vs. Presence) between subject experiment (n = 159) found smartphone ads received higher disliking intention compared with software ads. Ads use the ego strategy received higher user engagement compared with ads use the non-ego strategy. A two-way interaction effect of music and product type on liking intention was obtained. Theoretical and practical implications were discussed.

Keywords: Consumer technology video ads User engagement Music Ego Content analysis Experiment

Introduction

Consumer technology product's retail revenue is expected to reach 485 billion U.S. dollars in the United States in 2023 [1]. Among which, OLED TVs are expected to generate 2.3 billion U.S. dollars and portable gaming consoles are expected to generate 1.5 billion U.S. dollars [2]. Since technology products continue to be a

strong draw for consumers, advertisers and marketers have sought to entice consumers to engage with the products' advertising. One of the most popular platforms to foster user engagement is YouTube [3].

YouTube has more than 2.68 billion active users [4]. About 62 percent of businesses post videos on YouTube and use it as an advertising platform [2]. Previous studies have examined user engagement with YouTube videos from the category of science [5] and social media influencers (Munaro et al., 2021). Yang et al. (2023) found shorter videos were more likely to be viewed. Social endorsement cues significantly related to variations in user engagement, with likes having a consistent positive association with all types of engagement. Another study found medium-length and long videos posted during non-business hours and weekdays and those using a subjective language style, less-active events, and temporal indications were more likely to receive higher user engagement [6]. However, the category of consumer technology ads has been given minimum attention.

Meanwhile, previous studies have examined the contributors of user engagement from the perspective of length (i.e. [6]), topic (i.e. Wang et al., 2016), language (i.e. [6]), and para-social interaction (i.e. [7]), however, few studies examined the contributors of user engagement from the perspective of product type, creative strategy, and music. Studying the connection between product type and user engagement could help the advertisers identify which type of product could drive higher user engagement. As there are so many types of products within the category of consumer technology, some products

may pique higher interests from the consumers than the others. Thus, it is important to identify which type of product drives users' interests. Examining the relationship between creative strategy and user engagement can inform the advertisers the correct strategy to choose when it comes to designing consumer technology video ads. Previous literature suggested ego was a popular strategy used in viral video ads (Goland & Zaidner, 2008). This study could further examine whether ego was an appropriate strategy for consumer technology ads. Investigating the relationship between music and user engagement can inform the advertisers whether it is a good idea to use music in the consumer technology video ads. Previous study found using interactive background music could drive user engagement (Hwang & Oh, 2020). Our study could further testify whether music could increase user engagement under the context of consumer technology video ads.

This exploratory study aims to investigate the relationships between product type, creative strategy, music, and user engagement with consumer technology video ads. First, a content analysis of 300 consumer technology video ads will be conducted. The videos were selected from the most recent 30 video ads posted on the top ten consumer technology companies' YouTube channels. Table 1 provides an overview of the top ten consumer technology companies' YouTube channels. The top ten technology companies were chosen by their financial performances [8]. Based on the findings of the content analysis study, an experiment will be conducted to further examine what contributes to the user engagement of consumer technology video ads.

Literature review

User engagement and product type

The definition of user engagement is versatile. Human Computer Interaction (HCI) scholars defined user engagement as a process that encompasses users' initial reactions to technologies and sustained use of and re-engagement with information systems over time [9]. Communication scholars defined user as a psychological experience with the combination of physical interaction, interface assessment, absorption, and digital outreach [10].

In the field of advertising, user engagement is a multidimensional concept emerging from

people's thoughts and feelings about one or more rich experiences of reaching a personal goal [11]. User engagement has been examined under the context of YouTube advertising, Facebook advertising, and advergames (Castiblanco Jimenez et al., 2022; [12,13]). In a YouTube advertising study, it is found that high-arousal ads were watched for longer time and were more effective in congruent contexts. [12]. The Facebook advertising study showed attitude and subjective norm could influence user engagement with Facebook advertising, which led to actual engagement [13]. In the advergames study, it is found that a more interactive advertisement could increase user engagement, which would further increase purchase intention (Castiblanco Jimenez et al., 2022). All these studies suggested user engagement is an important predictor of purchase intention or actual engagement behavior.

In the current study, user engagement with consumer technology video ads is conceptualized as people's engagement with the technology video content as represented by the number of views, likes, dislikes, and

Table 1 Overview of the top ten consumer technology companies' YouTube channels.

Company	Number of Subscribers	Number of Videos	YouTube Channel Link
Apple	17,300,000	179	https://www.youtube.com/@Apple
Samsung	6,400,000	1800	https://www.youtube.com/@Samsung
Amazon	537,000	443	https://www.youtube.com/@amazon
Google	11,100,000	2800	https://www.youtube.com/@Google
Microsoft	1,120,000	1000	https://www.youtube.com/@Microsoft
IBM	321,000	107	https://www.youtube.com/@IBM
Dell	221,000	589	https://www.youtube.com/@Dell
Intel	584,000	908	https://www.youtube.com/@Intel
HP	250,000	949	https://www.youtube.com/@HPinc
Facebook	1,320,000	169	https://www.youtube.com/@facebookapp

comments. This conceptualization mirrors Wang et al. (2016)'s definition in which user engagement refers to people's engagement with the networked narratives on the social network sites as represented by the number of likes, shares, and comments. User engagement with the ads is a primary reason brands would share video ads on YouTube; engagement with ads will move them higher in the overall algorithm and will drive further views by other users [14]. Thus, engagement is a key outcome desire for brands building audience on social media. Previous study has used the framing theory to examine the health

messages in e-cigarette advertisements [15]. Previous research has also examined the user engagement of social media posts [16]. However, few studies have examined the user engagement of YouTube advertising from the perspective of technology products. This study aims to examine the relationship between different types of consumer technology products and user engagement. Since certain technology product receives higher user interest and attention, the user engagement among different types of consumer technology products may be different. Thus, the following research question is raised:

RQ1: What is the relationship between product type and user engagement with consumer technology video ads?

Message strategy wheel

The present study uses Taylor's six segment message strategy wheel as an overarching framework for understanding traditional advertising appeals. Taylor's six-segment message strategy wheel can be viewed from two perspectives: transmission and ritual [17]. The transmission communication delivers information, knowledge, and ideas to others while the ritual communication extends the message content to people's beliefs, attitudes, and perceptions [18]. The transmission view consists of three strategies: routine, acute need, and ration. Routine refers to the message strategy that tailor to people's habitual use of products or services [17]. Acute need refers to the message strategy that appeals to people's immediate and urgent need of a product or service [17]. Ration refers to the message strategy that appeals to consumer's active involvement in obtaining the needed information [17]. The ritual view consists of the other three strategies: ego, social, and sensory. Ego refers to a message strategy that presents the product or service that can define who the consumer is [17]. Social refers to the message strategy that can connect people with their significant others such as friends, lovers, and family members [17]. Sensory refers to the message strategy that appeals to people's five senses: touch, vision, smell, taste, and hearing [17]).

Ego is characterized by the Freudian Psychoanalytic Model [17]. Freudian Psychoanalytic Model posited that consumers are ego related to fulfill their emotional needs (Freud, 1977). For this strategy, consumer's emotional

needs are fulfilled by products that are ego related. The ego strategy allows consumers to make purchase decisions that are aligned with themselves about who they are. Ads using the ego strategy are using the vanity, self-actualization appeals, include user image or use occasion. The message should empathize "I am me" regardless of "who I am." The communication strategy is to show how the product fits with the consumers' definitions of who they are [17]. This strategy is based on consumers' needs for recognition through consumption. Products that could use the ego strategy include luxury cars, watches, clothes, fragrance, publications, and so on.

Taylor's six segment message strategy wheel has been frequently used as a framework in advertising content analysis studies [19–21]. Golan and Zaidner [20] conducted a content analysis of 360 viral ads and found that ego was the most frequently used creative strategy, based on themes like humor and sexuality. Product categories such as fashion, alcohol, and tobacco used the ego strategy the most [20]. James [21] conducted a content analysis for 317 magazine luxury ads and found ego was also the most frequently used strategy. Luxury brands are brands that are indulging and enjoyable [21]. Ahn et al. [19] conducted a content analysis about the communication strategies in cosmetic surgery websites. It is found that cosmetic surgery websites used an even division between transmission and ritual approaches [19]. Specifically, websites using the ego strategy were more likely than other strategies to use a clothed female model and to exclude male models and were more likely to use photography on the website and to include testimonials [19].

The above-mentioned studies suggest that ego is a popular creative strategy used in viral ads [20], luxury magazine ads [21], and cosmetic surgery websites [19]. Since consumer technology products are highly individualistic, do consumer technology ads use ego strategy the most as well? How are consumer technology video ads using Taylor's six segment message strategy wheel and how do they influence user engagement? Thus, the following research question is posed:

RQ2: What is the relationship between Taylor's six-segment message strategies and user engagement with consumer technology video ads?

Music

Besides Taylor's six segment message strategy wheel, music is another component advertisers like to use to promote products. A recent Nielsen study found ads with music performed better than ads without music on four dimensions: creativity, empathy, emotive power, and information power [22]. For example, HP used Meghan Trainor's song, "Lips are moving" while showcasing HP's tablet in its commercial which helped create a 26 percent increase in total dollar volume among her fans while the ad was airing [22]. The reason is that music can help evoke images, create ambience, trigger feelings and thoughts, and thus enhance memory (Hecker, 1984).

The effect of music in advertising has been documented on product perceptions, advertising effectiveness, memory, and message recall ([23, 24]; Fraser & Bradford, 2012; [25–30]). According to the music theory, music could impart two types of meanings: embodied meaning (hedonic, context independent) and inferential meaning (context dependent, semantic-laden) (Myers, 1994). Research found when people were engaged in non-intensive information processing, they were insensitive to either type of meaning [30]. When people were engaged in intensive information processing, they would base their product perceptions on referential meaning when the ad message processing required few resources and base their product perceptions on embodied meaning when the ad message processing was resource demanding [30]. Similarly, another study found when music was used to evoke emotions congruent with the symbolic meaning of product purchase, the likelihood of purchasing would be enhanced (Albert et al., 2003).

Gore (1982)'s study suggested hearing liked or disliked music while being exposed to product could influence product preferences directly. Kellaris and Cox [26] tried to replicate Gore (1982)'s study, however, they found there was no significant relationship between music appeal and product choice. In a later study, they found that message reception was influenced by the interplay of two musical properties: attention gaining value (slow and soft music can trigger low level of attention while fast and loud music can trigger high level of attention) and music message congruency (the extent to which instrumental music could evoke meanings that are congruent with those evoked by the ad messages).

Increasing audience attention to music could enhance message reception when the music evoked message congruent versus incongruent thoughts [27].

Previous studies have also examined the use of popular music or coming of age songs in ads and the impact on advertising effectiveness [23,28]. It is found that song vocals, either original or altered, were more effective stimuli of advertising effects than instrumentals or no popular music [23]. Moreover, when the participants thought the artist was significant, ad with the original vocal led to greater brand attention. When the participant thought the artist was not significant, ad with the altered vocal led to greater brand attention [23]. Lourenço et al. [28] found using coming-of-age songs in video ads could enhance ad effectiveness including brand name recall, ad and brand evaluations, and purchase intention [28]. The underlying mechanism is that coming-of-age music could trigger familiarity, which could further trigger liking and leading to music evoked memories and music evoked emotions. The whole process was moderated by developmental attachment styles [28].

Other studies suggested using music in the ads may not be effective, as it can potentially distract people from processing the information (Fraser & Bradford, 2021; [29]). Contrary to Allan [23]'s study, Olsen [29]'s study suggested silence outperformed background music on recall. It is found that ad using silence effectively increased the listener retention of ad information compared with ad using background music [29]. However, ads without background music did not induce greater overall recall than ads with background music throughout [29]. Fraser and Bradford (2012) found message recall was higher for ads with music background with less frequent change. For new and unfamiliar brands, using background music would decrease message recall compared with using background music for established brands.

Previous studies have also examined the relationship between music and user engagement (Hwang & Oh, 2020; [31]). A content analysis study about music videos on YouTube found derivative music videos received higher user engagement compared with user-appropriate music videos [31]. User engagement between still videos and music videos was almost the same [31]. Another study found consumers in the

interactive music condition had higher affective engagement in the shopping task compared to those in the control condition with no background music and the static background music condition (Hwang & Oh, 2020). Higher affective engagement led to stronger behavioral intention and more positive perception toward the website and the brand (Hwang & Oh, 2020)

The abovementioned studies suggested music could increase or decrease advertising effectiveness (i.e. Gore, 1982; [29]). Previous study also found music could enhance affective engagement (Hwang & Oh, 2020). However, few studies have examined the relationship between music used in consumer technology video ads and user engagement. Does using music in the consumer technology video ads help generate higher user engagement? The following research question is raised:

RQ3: What is the relationship between music and user engagement with consumer technology video ads?

study one

Sampling

A content analysis was conducted for 300 consumer technology video ads obtained from YouTube. The posted date for the 300 videos ranged from December 6, 2012, to July 17, 2018. The links of the 300 YouTube videos were copy and pasted into an excel document. Data was collected between February 2018 and July 2018. In James [21]'s content analysis study, they chose ads from six sectors: alcohol, apparel, automotive, fastmoving consumer goods (FMCG), and luxury. For alcohol, brands like Moet & Chandon, Smirnoff, Johnny Walker, and Heineken were used. In our study, a total of ten consumer technology companies were chosen for this study: Apple, Samsung, Amazon, Google, Microsoft, IBM, Dell, Intel, HP, and Facebook. These ten companies were chosen as they represent the most popular technology companies in the United States based on the financial performance [8].

After that, the researchers went to these companies' YouTube channels and searched for their latest 30 video ads. These video ads were selected carefully. If the video was about tutorials or keynotes, it was not selected for the study as it belonged to a type of organic content. All videos used in this study were commercials ranging from 15 s to 361 s. Based on this criterion, a total of

three hundred video ads ($n = 300$) were selected from YouTube. The unit analysis of the study was each Coder training.

Three coders were trained to code in this study. During the coding training session, all three coders coded the same 30 ads (10 % of the sample size) together. The reliability score was calculated using Krippendorff's α to make sure it passed .8 for each variable. If the score did not pass .8, the code sheet was modified until the threshold of the reliability was met. A total of 25 variables were coded with the reliability scores ranging from .8 to 1. After the coder training, the same three coders coded the remaining video ads ($N = 270$) separately.

Dependent variable. The dependent variable of this study is user engagement. User engagement was measured with the number of views ($M = 1047377.35$; $SD = 361042.97$, Range: 181–46807974), number of likes ($M = 3,907.03$; $SD = 17,051.24$, Range: 0–194000), number of dislikes ($M = 668.77$; $SD = 2,537.60$, Range: 0–29000), and number of comments ($M = 146.89$; $SD = 774.30$, Range: 0–10474).

Other variables. Other variables used in this study are video length measured in number of seconds ($M = 49.25$, $SD = 39.95$, Range: 15–361) and days the video stayed on YouTube since the posted date ($M = 2071.37$, $SD = 332.76$, Range: 1807–3856).

See Table 2 for the descriptive statistics for all the measured variables.

Table 2 Descriptive statistics for study one.

	Absence	Presence
<i>Product Type</i>		
IoT	69.20 %	30.80 %
SNS	75.30 %	24.70 %
Computer	82.70 %	17.30 %
Tablet	88.70 %	11.30 %
Smartphone	89.20 %	10.80 %
VR/AR	92.70 %	7.30 %
Software	92.70 %	7.30 %
Network	97 %	3 %
Printer	97.30 %	2.70 %
Drone	98.30 %	1.70 %
<i>Creative Strategy</i>		
Routine	65 %	35 %
Ego	72 %	28 %
Sensory	78.30 %	21.70 %
Social	81.30 %	18.70 %
Acute Need	88.30 %	11.70 %
Ration	91.90 %	8.10 %
<i>Music</i>		
Music	9 %	91 %

Results

To answer RQ1-3, a series of hierarchical multiple regressions were conducted. Four two-stage hierarchical multiple regressions were conducted with number of views, number of likes, number of dislikes, and number of comments entered as the dependent variables. Length and

days passed were entered at stage one of the regression to control for the length of the consumer technology video ads and how long the video ads have stayed on YouTube. Product types (printer, VR/AR, drone, smartphone, tablet, computer, network, software, IoT, SNS), creative strategies (ego, social, sensory, social, routine, acute need), and music were entered at stage two. For number of views, length ($\beta = .18$, $p < .01$), smartphone ($\beta = .18$, $p < .05$), software ($\beta = .13$, $p < .05$) and IoT ($\beta = .19$, $p < .05$) were positively associated with the number of views. This showed that longer video ads were associated with more views. If the video ad belonged to the category of smartphone, software, or IoT, it had more views. Music ($\beta = -.22$, $p < .01$) was negatively associated with the number of views. This finding showed if the video ad used music, it had less views. Together, they explained 13 % of the variance, $F(19, 269) = 2.09$, $p < .01$. See Table 3 for hierarchical regression on number of views

For number of likes, length ($\beta = .43$, $p < .001$), and smartphone ($\beta = .28$, $p < .001$) were positively associated with the number of likes. This showed longer video ad led to higher number of likes. If the video ad fell into the category of smartphone, it received more likes. Music ($\beta = -.14$, $p < .05$) was negatively associated with the number of likes. This showed if the video ad used music, it received less likes. Together, they explained 26 % of the variance, $F(19, 271) = 4.90$, $p < .001$. See Table 4 for hierarchical regression on number of likes.

For number of dislikes, length ($\beta = .19$, $p < .01$), smartphone ($\beta = .38$, $p < .001$), and ego ($\beta = .13$, $p < .05$) were positively associated with the number of dislikes. This showed if the video ad was long, fell into the category of smartphone or used the creative strategy of ego, it received. Table 3 Hierarchical regression on number of views.

	Model 1		Model 2	
	β (B)	t (SE)	β (B)	t (SE)
Constant	(2119386.24)	(1403817.36)	(3283978.09)	(1749705.84)
Control Variables				
Length	0.13*	2.11	0.18**	2.87
Days Passed	-0.07	-1.14	-0.07	-1.05
R ² (%)	0.02			
Product Types				
Printer			-0.05	-0.81
AR/VR			-0.02	-0.33
Drone			-0.01	-0.22
Smartphone			0.17*	2.27
Tablet			-0.01	-0.18
Computer			0.08	1.16
Network			-0.00	-0.02
Software			0.13*	2.11
IoT			0.19*	2.42
SNS			0.05	0.64
Creative Strategy				
Ego			0.11	1.66
Social			-0.01	-0.22
Sensory			0.03	0.47
Routine			-0.02	-0.28
Acute Need			0.03	0.50
Ration			0.11	1.66
Music			-0.22***	-3.51
Inc. R ² (%)	0.13			
Total R ² (%)	0.15			
N	300			

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

Table 4 Hierarchical regression on number of likes

	Model 1		Model 2	
	β (B)	t (SE)	β (B)	t (SE)
Constant	(10555.87)	(6140.44)	(11115.73)	(7478.30)
Control Variables				
Length	0.35***	6.25	0.43***	7.57
Days Passed	-0.13	-2.26	-0.09	-1.56
R ² (%)	0.12			
Product Types				
Printer			-0.10	-1.76
AR/VR			-0.00	-0.03
Drone			-0.01	-0.12
Smartphone			0.28***	4.15
Tablet			0.06	0.91
Computer			0.01	0.14
Network			0.03	0.49
Software			0.02	0.41
IoT			0.12	1.71
SNS			-0.05	-0.78
Creative Strategy				
Ego			0.10	1.64
Social			-0.09	-1.66
Sensory			-0.11	-1.83
Routine			-0.05	-0.76
Acute Need			-0.02	-0.40
Ration			-0.04	-0.78
Music			-0.14*	-2.40
Inc. R ² (%)	0.26			
Total R ² (%)	0.38			
N	300			

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

higher number of dislikes. Printer ($\beta = -.13$, $p < .05$) and sensory ($\beta = -.13$, $p < .05$) were negatively associated with the number of dislikes. This showed if the video ad was about printer and used the sensory strategy, it received lower number of dislikes. Together, they explained 20 % of the variance, $F(19, 271) = 3.86$, $p < .001$. See Table 5 for

Table 5 Hierarchical regression on number of dislikes.

	Model 1		Model 2	
	β (B)	t (SE)	β (B)	t (SE)
Constant	(1770.52)	(970.37)	(875.35)	(1148.53)
<i>Control Variables</i>				
Length	0.12*	2.01	0.19**	3.25
Days Passed	-0.09	-1.52	-0.06	-1.01
R ² (%)	0.02			
<i>Product Types</i>				
Printer			-0.13*	-2.28
AR/VR			-0.01	-0.17
Drone			-0.01	-0.18
Smartphone			0.38***	5.48
Tablet			0.02	0.30
Computer			-0.03	-0.47
Network			0.02	0.27
Software			0.00	0.02
IoT			0.04	0.50
SNS			-0.02	-0.33
<i>Creative Strategy</i>				
Ego			0.13*	2.14
Social			-0.04	-0.78
Sensory			-0.13*	-2.18
Routine			-0.02	-0.27
Acute Need			-0.04	-0.75
Ration			0.01	0.10
<i>Music</i>				
Music			-0.00	-0.07
Inc. R ² (%)	0.21			
Total R ² (%)	0.23			
N	300			

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

hierarchical regressions on number of dislikes. For number of comments, none of the variables were associated with the number of comments, $F(19, 271) = 1.03$, $p = .43$.

Study two

Study design

Since smartphone, software, music, and ego were found to have positive and statistically significant relationships with user engagement from the content analysis study, these variables were used to conduct the post-test. IoT was not tested because smartphone is a more specific example of IoT. Printer and sensory were not tested because they were negatively associated with user engagement. A 2 (Product Type: Smartphone vs. Software) \times 2 (Music: Absent vs. Present) \times 2 (Ego: Absent vs Present) between subject experiment ($N = 159$) was conducted to examine the impact of product types, music, and ego on user engagement of the consumer technology video ads.

Procedures

The online experiment was hosted on Qualtrics. Then the Qualtrics link was distributed to MTurk to collect data. After giving the informed consent, participants were told to watch an ad carefully. They were randomly assigned to watch one of the eight ads: 1) Smartphone + Yes Music + Yes Ego; 2) Smartphone + Yes Music + No Ego; 3) Smartphone + No Music + Yes Ego; 4) Smartphone + No Music + No Ego; 5) Software + Yes Music + Yes Ego; 6) Software + Yes Music + No Ego; 7) Software + No Music + Yes Ego; and 8) Software + No Music + No Ego. After watching the ad, they were asked about their

viewing, liking, and disliking intentions. They were also asked about their user engagement toward the ad. Three demographic questions were posed at the end of the survey. The total experiment lasted for less than five minutes, and each participant was rewarded with 25 cents.

Participants

A total of one hundred and fifty-nine people recruited from Amazon Mechanic Turk participated in this study ($N = 159$). The average age of the participants was 39 years old ($SD = 11.56$, Range = 18 - 69). More than half of the participants were males (59.7 %) and the rest of them were females (40.3 %). Most of the participants were Whites (91.8 %), followed by Asian/Pacific Islander (3.1 %), Black/African Americans (2.5 %), and Native American/American Indians (.6 %).

Experimental materials

An ad about iPhone X was selected from the category of smartphone and an ad about 3D painting was selected from the category of software. Both ads were selected from the original 300 video ads pool. The iPhone X ad and the 3D painting ad were selected as they were about the same video length. The iPhone X ad was edited down to have the music version and the no music version. The music version contained the background music while the no music version had the background music removed. The iPhone X ad was also edited down to have the ego version and the non-ego version. The ego version contained footage where people showed pride while using the new feature of iPhone X. The nonego version deleted this part of footage. The same editing was repeated for the 3D painting ad. The music version contained the background music while the no music version had the background music removed. The ego version contained footage where people showed pride while using the 3D painting software while the non-ego version had this part removed.

A total of eight video ads were used as stimuli in this experiment. These eight video ads were: (1) Smartphone + Yes Music + Yes Ego; (2) Smartphone + Yes Music + No Ego; (3) Smartphone + No Music + Yes Ego; (4) Smartphone + No Music + No Ego; (5) Software + Yes Music + Yes Ego; (6) Software + Yes Music + No Ego; (7) Software + No Music + Yes Ego; and (8) Software + No Music + No Ego.

Each video ad lasted about 60 s. The eight video stimuli can be found in the appendix.

Results

A MANOVA test was employed to examine product types, music, and ego on user engagement toward the consumer technology video ads. The multivariate test showed an interaction of product type and music on liking intention was obtained, Wilks' $\Lambda = .92$, $F(4, 148) = 3.15$, $p < .05$, partial $\eta^2 = .08$. Subsequent univariate analysis showed product type had a main effect on disliking intention, $F(1, 151) = 6.65$, $p < .05$, partial $\eta^2 = .04$. Specifically, smartphone ads ($M = 4.13$, $SE = .26$) received significantly higher disliking intention compared with the software ads ($M = 3.17$, $SE = .26$). See Fig. 1 for more details. Subsequent univariate analysis showed ego had a main effect on user engagement, $F(1, 151) = 4.32$, $p < .05$, partial $\eta^2 = .03$. Specifically, ads using the ego strategy ($M = 5.86$, $SE = 1.00$) received significantly higher user engagement compared with ads using the non-ego strategy ($M = 5.59$, $SE = .09$). See Fig. 2 for more details. Subsequent univariate analysis revealed that a two-way interaction of product type and music on liking intention was obtained, $F(1, 151) = 9.01$, $p < .01$, partial $\eta^2 = .06$. Specifically, for the software ads, ads with no background music ($M = 6.48$, $SE = .17$) received higher liking intention compared with ads using the background music ($M = 5.95$, $SE = .17$). For the smartphone ads, ads using the music background ($M = 6.27$, $SE = .17$) received higher liking intention compared with the ads without any music ($M = 5.78$, $SE = .17$). See Fig. 3 for more details. See Table 7 for the interaction effect of product type and music on liking intention.

Discussion

This study examined the relationship between product type, creative strategy, music, and user engagement with consumer technology video ads by using both the content analysis method and the experiment method. For product type, this study found that if the technology video

Table 6 Descriptive statistics of measured variables for all experimental conditions.

	Software				Smartphone			
	Mean	SD	Min	Max	Mean	SD	Min	Max
User Engagement	5.86 (1.00)	0.86 (0.86)	4.32 (1.00)	6.48 (1.00)	5.59 (0.09)	0.76 (0.86)	4.32 (1.00)	6.48 (1.00)
Liking Intention	6.27 (0.17)	0.86 (0.86)	4.32 (1.00)	6.48 (1.00)	5.78 (0.17)	0.76 (0.86)	4.32 (1.00)	6.48 (1.00)
Disliking Intention	3.17 (0.26)	0.86 (0.86)	1.57 (0.26)	4.13 (0.26)	4.13 (0.26)	0.86 (0.86)	2.57 (0.26)	4.13 (0.26)

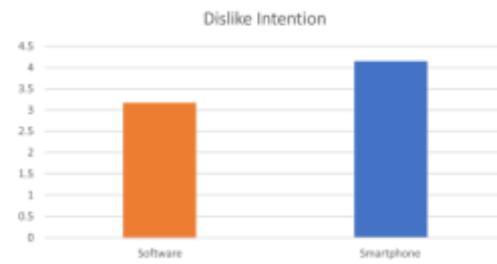


Fig. 1. Product type had a main effect on disliking intention.

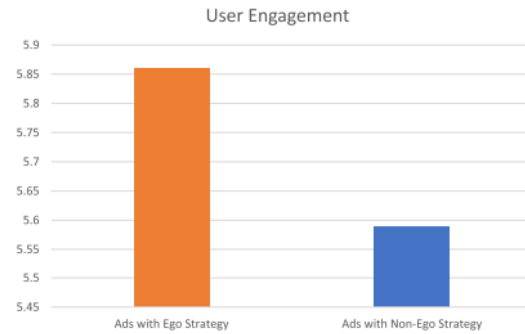


Fig. 2. Ego had a main effect on user engagement

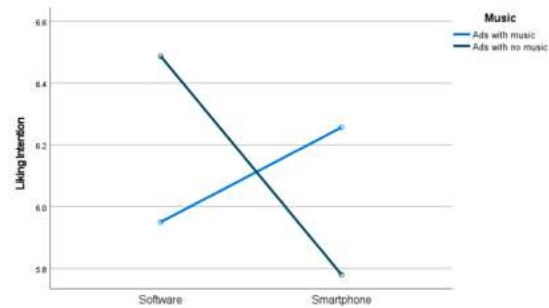


Fig. 3. Product type and music had a two-way interaction on liking intention.

ad fell into the category of smartphone, software, or IoT, it received higher number of views. This is probably because these products are more utilitarian products so that people generally have higher information needs for them. Previous research showed utilitarian product related factors such as perceived product quality led to Chinese

Table 7 Liking intention: product type x music.

		No Music		Music	
		M	SE	M	SE
Software		6.48 _{ab}	0.17	5.95 _{ba}	0.17
Smartphone		5.78 _{ba}	0.17	6.27 _{ab}	0.17

$F(1, 151) = 9.01$, $p < .01$, partial $\eta^2 = .06$. Note: Using Holm's sequential bonferroni post hoc comparisons, within rows, means with no lower case subscript in common differ at $p < .05$; within columns, means with no upper case subscript in common differ at $p < .05$.

customer's smartphone repurchase intention [33]. If the technology video ad was about smartphone, it led to higher number of likes and dislikes at the same time. This is likely because once the

viewership of the ad increased, the number of likes and dislikes would increase too. If the technology video ad fell into the category of printer, it led to lower number of dislikes. The reason is probably because printer was a less popular technology product compared with smartphone or software, thus, it received less viewership and a smaller number of dislikes. For creative strategy, the results from the content analysis study showed if the technology video ad used the ego strategy, it received higher number of dislikes. However, in the subsequent experiment study, ads using the ego strategy received higher level of user engagement compared with ads using the non-ego strategy. These findings suggest that people do not like ads using the ego strategy, but they are engaged with such type of ads. This finding is consistent with previous studies in which ego was found as a popular creative strategy used in viral ads, magazine ads featuring luxury products, and cosmetic surgery websites (Golan & Zeidner, 2008; [19,21]). The ego strategy was also used frequently by higher revenue companies. Product categories such clothing, footwear, credit cards, and investment like to use the ego strategy as well [34,35]. The reason is that ego could reflect one's personality and preference so that it can reflect one's individualism. Just like clothing and footwear, technology products often showcase an individual's personality and characteristics, thus, using the ego strategy in the consumer technology video ads is appropriate and can increase user engagement even if such engagement means people click the dislike button on YouTube. Dislikes could also be regarded as manifestations of engagement. Previous study found for participation on YouTube, the strongest predictor for disliking videos was the relaxing entertainment motive [36]. In addition, males were more likely to dislike YouTube videos compared with females [36].

Theoretical implications

This study has several theoretical implications. First, it contributed to the literature of user engagement in the field of advertising. This is one of the few studies to examine the user engagement of consumer technology products. Meanwhile, it used both the content analysis and the experiment methods. Previous studies have mainly used the content analysis method. Adding the experiment could help us better understand the underlying

mechanism of user engagement of technology product videos on YouTube. Second, it identified several types of consumer technology products that can lead to high user engagement. These product types are software, smartphone, and IoT. Third, this study contributed to the literature of Taylor's six segment creative strategies by further demonstrating ego as an important creative strategy that can be used in consumer technology products. Using the ego strategy in the consumer technology ads may lead to higher number of dislikes but it could generate higher user engagement. Third, it contributed to the literature of using music in video ads. Previous studies found both the positive and negative effects of using music in ads (i.e. Gore, 1982; [29]). This study found that music should be used based on the nature of the product. If the product is utilitarian oriented, using background music is not a good idea as it will interfere people's information processing thus leading to lower user engagement. If the product is hedonic oriented, using music can enhance information processing thereby leading to higher user engagement.

Practical implications

The findings in the current study can act as a roadmap for marketers wishing to implement engagement-driven consumer technology product strategies. It also contributes to the field of psychosocial effects of social media. Results from this study suggested that if the consumer technology ad fell into the category of software, smartphone, or IoT, it would receive higher number of views. The smartphone ads tend to be more controversial as they would receive both high number of dislikes and likes. This indicated consumers have a love hate relationship with smartphone video ads. Meanwhile, advertisers should continue to use the ego strategy to boost user engagement. In addition, using music in the ad should be considered based on different product types. The study suggested adding music to the smartphone ad would increase people's liking intention. The software ad may not need a background music as people were paying more attention to the demonstration of the software rather than the background music.

Limitations and future study

This study has several limitations. First, the sample size of the content analysis study is relatively small, future study could analyze more

consumer technology video ads to find interesting themes and patterns. Second, the experiment study compared the software ad and the smartphone ad from two different brands. People may have better brand attitude toward Apple than with Microsoft. Future study should control this variable by using different products from the same brand to reduce the effect of pre-brand attitude on user engagement.

Conclusion

This study examined the relationship between product type, creative strategy, music, and user engagement with consumer technology video ads on YouTube using both the content analysis and the experiment methods. Results showed product type, creative strategy, and music could all influence user engagement. Product types such as smartphone, software, and IoT could bring in higher number of views. Consumer technology video ads should adopt the ego strategy to boost user engagement. Product type should be taken into consideration when it comes to using background music in consumer technology video ads.

Declaration of Competing Interest

The author declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data that has been used is confidential.

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