

The Effects of Video Advertising in Accordance with the Frequency of Exposure of Digital Limited-Interruption Advertising

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Abstract Background/Objectives: Digital video provides a new opportunity to support television advertising in advertising strategy. The purpose of this study is to examine the effect of the limited-interruption advertising used in YouTube by advertising frequency level.

Methods/Statistical analysis: It is important to verify the effectiveness of YouTube limited-interruption advertising videos that are actively used in practice. The experiments were shown to four groups (total of 146 samples) according to the frequency of limited-interruption advertising exposure. After showing experimental advertising samples, advertising effects were measured. A total of four experiments were performed.

Findings: There was no statistically significant difference between advertising/brand attitudes according to the frequency of limited-interruption advertising exposure frequency. However, the tendency that the recall of the advertisement is increased as the frequency of limited-interruption ad exposure increases is statistically verified. As the results of the previous study suggest, the higher the frequency of exposure, the more the ad recall increases. The results of the individual item test for the attitude of the advertising showed that the more the frequency of the limited-interruption advertising exposure, the higher the perception of advertising intrusiveness. Overall this study did not support the research hypothesis. However, the higher the frequency of limited-interruption advertising exposure, the higher the level of advertising recall and advertising intrusiveness.

Improvements/Applications: The findings of the study provide a unique view of the field to researchers and advertisers, including directions for future research and practical implications for digital limited-interruption advertising research.

Keywords: Limited-interruption Advertising, Mid-roll, Digital Video Advertising, YouTube, Advertising Frequency.

I. INTRODUCTION

Recently, viewers watch digital video free on YouTube via the internet by watching advertising or pay for digital video by subscribing services like Netflix. This OTT(over the top) service is expected to expand along with the growth of digital video advertising market.

According to Zenith Media advertising expenditure data, the mobile advertising market reached 107 billion dollars in 2017 and is expected to exceed desk-top advertising. The mobile advertising market is expected to grow and occupy 62.5% of the entire internet advertising market in 2019. In the USA, over 105 million consumers watched videos using smartphones in 2015[1]. In Korea, the mobile advertising market is expected to exceed the 2017desktop advertising market. Notably, the mobile video advertising expenditure is assumed to be 5 million dollars which is more than a 17% increase compared to 2016[2].

Meanwhile, the consistent decrease in ratings of network television and advertising expense along with the growth of online video advertising market requires efforts such as integrated viewing ratings and online marketing index development. The official advertising rating organization tries to sum up the statistical analysis of VOD video clips, video views, news articles, comments, and posts derived from programs despite the decreased program ratings as online advertising index. It also tries to evaluate the quantitative advertising value of them.

There is an effort trying to measure online ratings that supplement network television ratings in media environment with active 3-Screen(television, mobile, personal computer) advertising. In an empirical study, it was confirmed that using PC and mobile focusing on television appropriately leads to increase of advertising reach rates.

Digital video advertising is usually put at the front, middle or end of the contents. Most of the digital video advertising including YouTube adopted pre-roll advertising which puts advertisements in front of the contents. However, the emergence of new types of advertisement is important to advertisers who purchase the advertising slots. Limited-interrupted advertising was mainly used in network television, but it grants digital business for more advertising inventory other than current pre-roll advertising. It provides higher repetitive exposure in the environment where the television ratings are decreasing[3]. YouTube is most active in this type of advertising as it allowed to insert limited-interrupted advertising.

Digital video advertising provides new opportunities to support television advertising in advertising strategy. However, paid services like YouTube Red, which have no advertising, can be challenging in deciding the value of digital video

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advertising, because viewers can watch content without advertisements with paid subscription[4]. The results of a recent study showed that viewers are positive about advertising exposed on free contents service. This study investigated that television viewers preferred television programs with advertising and felt less interested in watching advertising only with programs[5]. The findings of previous studies demonstrated that interruption during programs could enhance the audience watching experiences and enjoyments [6,7].

This study aims to examine the influence of limited-interruption advertising exposure inserted in digital video to advertising effectiveness. This is because YouTube actively uses advertising products that are inserted and exposed in the middle of content. Specifically, the purpose of this study is to examine the difference in advertising/brand attitude and advertising cognition in accordance with the level of limited-interruption advertising exposure and investigate the level of proper limited-interruption advertising exposure for proper effectiveness.

II. MATERIALS AND METHODS

2.1.Literature Review

2.1.1. Effectiveness of limited-interruption advertising and advertising intrusiveness

The intrusive method of limited-interruption advertising was generally used to draw the interest of users due to the growth of digital advertising industry and competition among advertisers. For example, advertisements that start before YouTube content and advertisements in between the content are widely used in the industry. Recently, advertising videos longer than 5 seconds such as TrueView Advertising are widely used in mobile advertising.

The results of studies in effectiveness of digital limited-interruption advertising showed that this type of advertising is 2.5 times more effective than television advertising [8]. Another study concluded that limited-interruption advertising was more effective in brand recollection than pre-roll advertising. This is due to the attention spillover that comes in the middle of the program[9].

A study examined the advertising effectiveness among YouTube's limited-interruption advertising and pre-roll. The results of this study confirmed that when less than four 30 second length limited-interruption advertisements were exposed in an hour, it was more effective than pre-roll in advertisement recollection. Meanwhile, both limited-interruption advertising and pre-roll advertising had higher effectiveness in short video advertising in the 15-second length. The perceived intrusiveness did not always have a negative influence on advertisement preference, brand attitude and purchase intention[1].

Recent studies have argued that limited-interruption advertising in television did not affect television program evaluation. Subjects in this study evaluated their enjoyment and involvement with the television program content

equivalently regardless of the presence of television advertising in the middle of program contents. Although television audiences try to avoid commercial intermissions in television watching conditions, this research showed television advertising interruptions in the middle of programs could enhance the enjoyment and involvement with watching experience[5].

As for the studies about advertisement intrusiveness and effectiveness in accordance with types of digital advertising, it was confirmed that there was no perceived difference in intrusiveness between pre-roll and limited-interruption advertising[10]. A study measured the influence of advertising intrusiveness in the cognitive processing of viewer through a brain test, which indicated that the advertising exposure decreased the content concentration of users and deteriorated frontal lobe activity[11].

Digital is a more purpose-oriented media compared to other types of media and has a relatively higher flow of internet users. Thus, digital advertising is perceived as a media with much higher intrusiveness than other types of advertising. The perceived goal impediment is a significant factor causing intrusiveness and inconvenience. Furthermore, advertising avoidance affects advertising attitude and brand image negatively. Previous research indicated users felt inconvenienced and avoided pop-up advertisements [12]. In other words, current digital video limited-interruption advertising increases advertising cognition. However, the study about advertising effectiveness showed mixed results due to the condition of intrusiveness and inconvenience.

2.1.2. Repetitive advertising exposure

It is believed that repetitive advertising exposure affects advertising recollection positively. However, it also increases perceived advertising intrusiveness. Thus, it could potentially affect advertising preference and persuasion negatively. Advertisers should understand the relative positive and negative advertising effectiveness of repeated limited-interruption advertising. In other words, there is a need to examine what is the proper level of repeated exposure regarding advertising recollection and preference[12]. The result of a study about limited-interruption advertising showed that when consumers are exposed to more than four advertising in an hour, they evaluate the advertising less positively than when exposed to less than three advertising in an hour [1].

2.1.3 Advertising effectiveness

While the long advertising increased recognition of advertising messages, limited-interruption advertising increased recognition effectiveness about brand names more than pre-roll and post-roll advertisements. It can be understood this is a result of the spillover effect of interest. However, when there is no correspondence between limited-interruption advertising and video contents, the effectiveness of advertising is low. In contrast, the recognition effect on the



brand name of post-roll advertising was increased in discordance. Discordance makes the advertising stand out for better recollection. For example, the recollection of car advertising on food programs was high[13].

Advertising effectiveness is different whether it is humorous or informative. If humor is connected to the message, it is much more memorable. If a viewer perceives the advertisement as humorous and informative, the overall evaluation becomes positive. Humorous advertising is especially more effective for a low-involvement product than high-involvement product [4].

Advertising attitude is important because the preferred advertisement has higher advertising effectiveness in both perception and persuasion. Repeated advertising exposure is twice more likely to persuade. The most important factor of advertising attitude is how significant and relevant the advertisement is. Likability and attitude of digital advertising are influenced by entertainment, information, and stimulation mediated by the perceived value of advertising.

Advertising likability is a factor that received a relatively higher score in persuasion. Results of consumer reactions to the intrusiveness of online-video advertisements showed that intrusive online-video advertisements had negative effects toward the advertised brand. On the other hand, informative and humorous online-video advertisements and longer advertisements were perceived as less interfering. The results of this research concluded that marketers try to test online-video advertising to accomplish maximal advertising results[12].

2.1.4 Research Hypothesis

Is there a difference in advertising effectiveness(advertising perception, advertisement attitude, brand attitude) in accordance with the level of limited-interruption advertising exposure?

Hypothesis 1-1: There will be a difference in advertising perception in accordance with the level of limited-interruption advertising exposure.

Hypothesis 1-2: There will be a difference in advertising attitude in accordance with the level of limited-interruption advertising exposure.

Hypothesis 1-3: There will be a difference in brand attitude in accordance with the level of limited-interruption advertising exposure.

2.2 Materials and Methods

Table 1: Ad Attitudes by Limited-interruption Ad Exposure Level

LMA Exposure Freq.	N	Mean	S.D	d.f.	F	p
Non-limited-interruption Ad	32	2.9766	0.45508	3	.955	0.416
1 limited-interruption Ad	38	2.7829	0.6906			
2 limited-interruption Ad	35	2.7214	0.71684			
3 limited-interruption Ad	41	2.7927	0.67059			
Total	146	2.8134	0.64715			

Table 2: Brand Attitude by Limited-interruption Ad Exposure Level

LMA Exposure Freq.	N	Mean	S.D	d.f.	F	p
Non-limited-interruption Ad	32	3.0078	0.47724	3	1.006	0.392
1 limited-interruption Ad	38	2.9605	0.68902			

This study collected 146 samples from both men and women in their 20s and 30s via a panel-based online survey company. After showing them a 15-minute length video including YouTube's limited-interruption advertising, the advertising effectiveness was measured.

The video was a TED program containing video advertising about the fourth industrial revolution that is popular among the 20s and 30s. Considering the internet as a purpose-oriented media, it seemed a lecture program with high timeliness and information was appropriate. Because the average length of the YouTube's video is 15 minutes, the study selected and edited 15-minute content for the experiment.

In this study, a carpool service advertising was used. Carpool service is a highly popular service in Korea among the young population. The inserted video advertising was 15 seconds, as it was as effective as 30 seconds advertising in advertisement perception and brand video.

III. RESULTS

3.1 Reliability

Before verifying the research questions, the study examined the internal reliability of the questions using Cronbach alpha. The result of measuring four advertising attitude items was .716 while the four brands attitude item was .614. It was relatively low, but excluding the inverse coding item, it was as high as .754 and .786. These reliability scores were valid enough to be used in the analysis of the effects of video advertising in accordance with the frequency of exposure of digital limited-interruption advertising. To test the three research hypotheses, ANOVA and Chi-square analyses were used with SPSS.

3.2 Results

To test the advertising attitude and brand attitude in accordance with limited-interruption advertising exposure frequency, the ANOVA was conducted. As shown in [Table 1] and [Table 2], there was no statistically significant difference among four groups. The mean scores for the non-limited-interruption ad, 1 limited-interruption ad, 2 limited-interruption ads, and 3 limited-interruption ads were 2.97, 2.78, 2.72, and 2.79 respectively.



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2 limited-interruption Ad	35	3.15	0.66199			
3 limited-interruption Ad	41	3.1585	0.57759			
Total	146	3.0719	0.61023			

The results of advertising perception as a dependent variable also showed that there was no statistically significant difference among the four groups ($X^2=5.209$, d.f.=3, $p=.127$). As shown in [Table 3], however, in linear-by-linear combination verification, the tendency of

increasing accuracy rate by advertising exposure was statistically significant. In other words, the higher the advertising exposure frequency is, the higher the advertising perception is.

Table 3: Linear-by-Linear Association

LMA Exposure Frequency	Correction	Non-Correction	Total	Chi-Square(d.f.) (Linear-by-Linear Association)	p
Non-limited-interruption Ad	18	14	32	5.209(3)	.022
1 limited-interruption Ad	24	14	38		
2 limited-interruption Ad	27	8	35		
3 limited-interruption Ad	32	9	41		
Total	101	45	146		

There was a difference between gender in ad attitudes. As shown in [Table 4], men's advertising attitude was higher in average compared to women. The average scores for man and woman were 2.94 and 2.69 respectively ($F=1.357$, $p=0.02$)

Table 4: Ad attitudes by gender

Group	N	M	S.D	d.f.	F	p
Man	70	2.9429	0.56654	144	2.357	0.02
Woman	76	2.6941	0.69594			

IV. CONCLUSION

There was no statistically significant result among advertising perception, advertising attitude, and brand attitude in accordance with limited-interruption advertising exposure frequency. However, it was confirmed statistically that the higher the frequency is, the higher the advertising perception accuracy is. In other words, it backed the study results that the higher the limited-interruption advertising exposure frequency is, the higher the advertising recollection is. As a result of verifying individual questions about advertising attitude, the higher the limited-interruption advertising exposure frequency is, the higher the advertising intrusiveness perception is. Overall, this study did not support the hypothesis. However, it confirmed that the higher limited-interruption advertising exposure frequency led to higher level of advertising perception and intrusiveness.

In digital advertising effectiveness research including SNS, intrusiveness and privacy concern are known as important variables affecting advertising attitude. Consumers perceive advertising accompanying videos as obstacles interrupting contents rather than focusing on its informative and entertainment features. In this study, there was no difference among groups in accordance with limited-interruption advertising exposure frequency. This indicates the consumer perceives advertising intrusiveness within contents more significantly. However, considering the higher the number of advertising exposure, the higher the tendency of advertising

perception/recollection is, there is a need to check the proper level of limited-interruption advertising exposure by minimizing the intrusiveness perception. Previous studies showed that less than four limited-interruption advertising in 60-minute content was more effective than pre-roll advertising.

Limited-interruption advertising could improve advertising awareness. However, there is a need to check its negative influence on advertising attitude and brand attitude especially because digital, advertising is a perceived much more intrusive than television. In previous research, when the exposure frequency of limited-interruption advertising is less than four times, it affected higher brand awareness and advertising attitude than more than five times. Limited-interruption advertising can be a great alternative to pre-roll advertising, and an opportunity for advertisers to expand advertising inventory.

Some cautions and limitations are included in interpreting the present study. First, this research uses an online survey. An online survey is a good method for showing external validity, but not a good method for improving internal validity.

Our study used only one real brand. As such, it does not provide proof about the generalizability of the results of other brands. Further research is needed including other brands to investigate the effect of the limited-interruption advertising used in YouTube by advertising frequency level.

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