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THE EFFECT OF SKIP FUNCTION IN PRE-ROLL ADVERTISING

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Abstract

The current study adopts two different studies with the same experimental stimuli but different levels of analysis. Study 1 would be a sort of theoretical evidence for Study 2. The purpose of Study 1 is to investigate the effects of the skip function in pre-roll advertising on (1) viewers' ad attention, (2) ad content recall, and (3) psychological responses to and attitudes toward the ad. Based on the assumptions of psychological reactance theory (Brehm, 1966), this study predicted that free-online-video users would have more positive psychological responses and more favorable attitude toward the skippable pre-roll ad, which gives the opportunity to avoid the forcefully exposed ad by skipping it (i.e., to restore threatened freedom), than the unskippable pre-roll ad. However, although attitudes toward the pre-roll ad did not significantly differ in both the skippable and unskippable situation, Study 1 showed that viewers were likely to feel less intrusiveness, irritation, and threatened freedom about the unskippable pre-roll ad than the skippable one. While Study 1 focuses on the comparison between two different formats of pre-roll advertising, the skippable and nonskippable ad, in terms of attention, recall, other psychological responses (i.e., perceived threatened freedom, perceived intrusiveness, and perceived irritation), Study 2 centers on the effect of dispersed attention on attitudes within each format of pre-roll advertising, thus modeling the process of psychological reactance. Study 2 found a negative association between psychological reactance and attitude, one of the most representative predictors for ad effectiveness.

Keywords: biased competition model, psychological reactance theory, hierarchy of effects model, dispersed attention

CHAPTER 1. Introduction

The tide of advertising is changing. Online advertising, as an increasing brand-communication tool, is becoming richer and smarter and taking the lead (Nudd, 2014). With the rapid growth of online advertising, the format of ads has also evolved to meet the needs of the new markets. Beyond traditional display ads such as banners, advertisers are attracted to video properties that offer exclusively high-definition and well-made content. A video ad is embedded in a content video clip, similar to traditional television commercials. As compensation for a free service, consumers are required to watch a commercial before being able to view the content video, which is called *pre-roll advertising*. Pre-roll advertising is the most typical type of online streaming advertising. Among various categories of online advertising, the growth of streaming advertising is manifested in numbers. According to the 2017 analysis of online advertising markets by an eMarketer report (eMarketer.com, 2018), streaming advertising amounted to 15.1 percent (\$12.55 billion) of total online advertising revenue (\$82.86 billion), up from 12.8 percent (\$7.68 billion) in 2015 and 14.3 percent (\$10.30 billion) in 2016. In addition, a report from BrightRoll (a video advertising software provider), which surveyed 120 U.S. ad agencies, shows that 72 percent of advertising agencies believed online video ads are as effective or more effective than TV ads (Gesenhues, 2015).

Although pre-roll advertising, as a popular type of video ad stratagem, already represents an important part of online advertising approaches, this richer, smarter format of advertising has received little academic attention within communications and marketing. Related to the detrimental environmental nature of online advertising, such

as ad clutter, intrusiveness, and goal impediment, many early online advertising studies have taken an interest in ad avoidance (Cho & Cheon, 2004; Edwards, Li, & Lee, 2002; Li, Edwards, & Lee, 2002). While the early studies focused on why consumers avoid online ads, the current study delineates whether avoided ads are still effective, an idea not examined previously in the research literature.

The impetus of the current study stems from the skip button, a unique feature of pre-roll ads, which provides an option for online users to skip the commercial by clicking a button when given the chance. The skip rate is very high. Although it is estimated conservatively, the skip rate reaches about 90 percent (Elkin, 2016), which indicates most pre-roll ads have no incentive to cause consumers to finish watching the ad. Thus a question arises about the effectiveness of pre-roll ads: “Are skippable pre-roll ads indeed effective?” Given that the skip function is usually activated after the first five seconds, the ad has a miniscule amount of time to grab viewers’ attention. Moreover, even though viewers are exposed to the ad for five seconds before skipping it, there is doubt whether they pay attention to the ad itself or only to the skip button showing the countdown to zero seconds.

The trend of recent online advertising research is aimed at how ad attention occurs under the competition of different ad types or formats (e.g., Gidloef, Holmberg, & Sandberg, 2012; Hsieh & Chen, 2011; Hsieh, Chen, & Ma, 2012; Lee & Ahn, 2012). However, a focal point that differentiates the current study from prior research is the focus on attention within only the exposed video ad, which differs entirely from the context of attending to banners and pop-ups in the situation mingled with main content and other competitive ads. Viewers are exposed to a single ad but may experience

attention dispersion within it (e.g., attention to the ad content or to the skip button within a skippable ad, and attention to the ad content or to the running time of the ad within a non-skippable ad). In addition, looking at the relationship between such dispersed attention and attitudes toward ads, the current study evaluates the effectiveness of pre-roll advertising.

The purpose of the study is (1) to investigate whether the skip function of pre-roll advertising embedded in free online streaming videos influences viewers' ad attention and recall of the ad content, and (2) to examine and compare how dispersed attention to a single ad affects attitudes toward skippable or unskippable pre-roll advertising and ad recall. By applying selective visual attention theories from a neurophysiological perspective (Desimone & Duncan, 1995), the current study assumes a hypothesized competition between viewers' attention to ad content and to the skip button and/or running time of the ad. Also, based on psychological reactance theory (Brehm, 1966), the study examines viewers' reactance to the forced pre-roll advertising either with or without the skip function, which may help viewers recover from a sense of threatened freedom, and investigates how negative psychological factors, such as perceived threatened freedom, perceived intrusiveness, and perceived irritation, have an influence on attitudes toward the ad, a factor conceptualized to predict ad effectiveness (Haley & Baldinger, 1991; Lee & Ahn, 2012; Thorson, Chi, & Leavitt, 1992). The current study also gives attention to *perceived social exchange* as a mediating variable that may alleviate the potentially negative impacts to attitude as they relate to psychological reactance to the forced ads. The rationale of this association can be explained by the social exchange theory (Emerson, 1976), which regards being forced

to watch the ad (either skippable or non-skippable) as the cost for using online streaming videos for free. This is the social exchange of cost and reward. Knowing why one must see an ad as an understanding of the macro structure of the media system may lead consumers to moderate innate negativity against advertising.

Two different thoughts to consider: first, forced, non-skippable viewing with longer exposure to an ad (i.e., more opportunity for ad attention but more threatened freedom) would lead to a more positive attitude toward the ad (like in the context of the non-skippable pre-roll ad), or the shorter and less forced, skippable exposure (less opportunity for ad attention but less threatened freedom) would lead to a more positive attitude toward the ad (like in the context of the skippable pre-roll ad). Regarding the effectiveness of advertising, this consideration may be a selective marketing strategy for reducing consumers' psychological reactance to advertising and increasing physical exposure to advertising. Second, in terms of recall, another predictor for ad effectiveness (Lee & Ahn, 2012; Stewart, 1986; Thorson et al., 1992), the non-skippable ad that seems to threaten consumers' freedom relative to the skippable ad would provide viewers more potential time for learning and remembering ad content. In light of that the classic hierarchy of effects model depicts a positive path from recall to attitude (Lewis, 1898; as cited in Thorson et al., 1992), this consideration may be another strategic conflict between the positive effect of recall on attitude and negative effects of psychological reactance on attitude.

In sum, this study focuses on the effectiveness of pre-roll advertising, restricted to three classic concepts of attention, recall, and attitude. Even though the three are nothing but cliché measures of ad effectiveness, it is expected that the technological

uniqueness of pre-roll advertising would differentiate the current study from prior related research. This study makes an academic contribution to the field of ad effectiveness research by demonstrating theoretical relationships between ad technology and ad effectiveness. This study also has practical implications for video advertising practitioners, including ad creators, advertisers, and free-stream video website marketers, because it draws a connection between whether the strategy of less forceful marketing, for five seconds, or of more forceful marketing, for 15 seconds, will be more effective.

The Plan of the Study

The plan of this study is as follows; the current study adopts two different studies with the same experimental stimuli but different levels of analysis. Study 1 would be a sort of theoretical evidence for Study 2. As stated in the introduction, this study questions whether skippable pre-roll ads are effective for two possible reasons: (1) attention competition that may occur between ad content and the skip button and (2) free-online-video viewers' psychological reactance against the forcefully exposed ad. Study 1 theoretically identifies these problems and hypothesizes them, based on the biased competition model of visual attention (Desimone & Duncan, 1995) and psychological reactance theory (Brehm, 1966), which will be addressed in the literature review. Due to the effects of the skip function on attention competition, viewers' perceptions and attitude toward the skippable pre-roll ad would be easily discernible in comparison with the context of unskippable pre-roll advertising. The methodology section introduces the experimental design to test the identified problems; the study uses the within-subjects test of attention competition within groups and the between-subjects

test of ad attention, ad recall, psychological responses, and attitude toward the ad among groups (e.g., a skippable-ad group with the skip button, an unskippable-ad group with the running-time bar, and a control group with no skip function or running time). The results and discussions follow. The discussion section includes theoretical interpretations of attention competition, attention mechanism (i.e., why attention dispersion occurs), different psychological reactance outcomes, ad recall and attitude between the different formats of pre-roll advertising, and practical implications of the results.

Then, Study 2 is reviewed in the following section. The basic assumption of Study 2, which is obtained from the results of Study 1, is that attention in a single pre-roll ad would be dispersed into ad content and other competitive objects, such as the skip button or the running-time bar. Based on this assumption, Study 2 aims to find out what would happen to ad effectiveness when viewers' attention is dispersed. Combining various *hierarchy of effects models* as a theoretical framework, Study 2 creates two different modified hierarchy of effects models for different formats of pre-roll advertising, which will be addressed in the literature review section. The models do not posit only the traditional linear paths from ad attention to attitude toward the ad and from ad attention to ad recall, but also postulate the distinctive paths from attention to the skip button/the running time, and from causal psychological responses (e.g., perceived intrusiveness, irritation, and threatened freedom) to attitude. In other words, Study 2 focuses not on ascending hierarchy to maximize ad effectiveness but on descending hierarchy to possibly minimize viewers' negative responses to the forced pre-roll ad. As stated, perceived social exchange plays a role as a mediating variable

between negative perceptions of and attitude toward the ad. The experiment for Study 2 is under identical conditions to Study 1, but a different analysis (i.e., structural equation modeling) is used to test the models. The results and discussions follow. The discussion section includes theoretical interpretations about the associations of dispersed attention with ad effectiveness and viewers' psychological responses, considerations about the mediating variable, and several practical implications of the results.

CHAPTER 2

Study 1: The Effects of Skip Function on Cognitive and Attitudinal Responses

Toward Pre-roll Advertising

The purpose of Study 1 is to investigate the effects of the skip function in pre-roll advertising on (1) viewers' ad attention, (2) ad content recall, and (3) psychological responses to and attitudes toward the ad. More specifically, first, the biased competition theory assumes that the skip button in the skippable pre-roll ad may distract viewers' attention (Desimone & Duncan, 1995); thus, Study 1 attempts to reveal a difference between the skippable and unskippable ad relative to ad attention. The theory also provides rationale for why viewers pay attention to the skip button in the skippable ad or the running time of the ad in the unskippable ad. Second, with respect to recall of ad content, physical ad exposure time, affected by the skip function, may make a difference between the skippable and nonskippable ad. Lastly, giving viewers an opportunity to avoid the forceful ad, the skip function may alleviate negativity toward it.

Theoretical Background: Selective Visual Attention

Prior online ad attention research has highlighted different levels of competing attention between ads and featured content (e.g., banners embedded in news articles on the webpage; Gidloef et al., 2012), between different ad forms (e.g., static vs. animated banners; Lee & Ahn, 2012), and between ads on different webpage types (e.g., banners in text- vs. picture- vs. video-based webpages; Hsieh & Chen, 2011). Pertaining to the nature of pre-roll advertising in this medium, this study focuses on different types of competitive objects that may distract viewers' attention. A pre-roll ad embedded in a featured content video is fully exposed to viewers without being interrupted by other

competitive advertisements, especially when displayed in full screen. For example, when people watch a YouTube video clip, they are exposed to no other ads but the pre-roll ad in the video clip. This format of advertising, which interacts one-on-one with viewers, may lead to higher attention than do other forms of online advertising. However, the skip button appearing on the ad or the displayed running time of the ad may instead distract or disperse viewers' attention to the ad. The process of how their attention is selected is explained by the following theory.

Biased Competition Model

Many neurophysiological experiments have been conducted to demonstrate the neural mechanism of biased competition in selective visual attention (Miller, Gochin, & Gross, 1993; Moran & Desimone, 1985; Motter, 1993; Spitzer, Desimone, & Moran, 1988). According to the assumptions of the biased competition model established by Desimone and Duncan (1995), multiple stimuli presented simultaneously in the visual field activate populations of neurons that involve competitive interactions. Then, attending to particular stimulus biases, these competitive interactions occur in favor of neurons that respond to the attended stimulus, receiving priority over unattended stimuli. In other words, the cells that represent the attended object should win out, suppressing cells representing other distracting objects. The question is which of these objects will win this competition and drive the neuron. Bottom-up and top-down factors can resolve this competition, and the result of these factors is the attentional effect.

According to Desimone and Duncan (1995), the bottom-up process primarily depends on the feature properties of the stimulus field. When objects are significantly salient and stand out from the surrounding image, attention priority (i.e., selective

attention) occurs immediately. This mechanism is associated with the pop-out effect (Gleitman & Jonides, 1978). Pop-out features (e.g., large, bright, moving, or unique objects) can attract attention without conscious processing. The visual system is biased toward pop-out objects that resolve the competition; thus, visual attention by bottom-up factors occurs in a passively automatic way (Desimone & Duncan, 1995), which refers to a more stimulus-based approach.

However, Desimone and Duncan (1995) argue that visual attention is not always selected by the bottom-up process. Another way the competition within the visual system can be biased is through top-down volitional feedback that relies on observers' pre-knowledge, expectations, intentions, and goals. The top-down feedback refers to a higher level of sensory processes with more cognition occurring when automatic processing by the bottom-up control conflicts with the observer's internal goal or does not gratify it. A study by Theeuwes and Van der Burg (2007) presented evidence of the top-down mechanism. Directing attention in a volitional way to a specific location in space increased the sensory gain for features at that location. Results imply that directing attention to a location results in a greater neuronal sensitivity. In other words, the top-down process guides attention only to target objects and avoids attention to irrelevant objects. Thus, this type of selection is endogenous and is often referred to as goal-driven selection (Desimone & Duncan, 1995), which is a more consumer-based approach. These attention processes can be applied to the context of pre-roll advertising, by its structural nature. Further details are described in the following section.

Competition for Visual Attention within a Pre-Roll Ad

When free-online-video users are exposed to a pre-roll ad, their visual attention system is confronted with two different objects located at different positions in the visual field—the ad content and the skip button in a skippable pre-roll ad as well as ad content and the running time of the ad in a non-skippable pre-roll ad. Within the system, a skippable pre-roll ad may have to compete for attention with the skip button appearing on the ad (See Figure 1-1). An attention competitor for a non-skippable pre-roll ad may be the running time of the ad, which indicates the time remaining until the ad is over (See Figure 1-2). The question comes to mind: Which object will win this competition and grab attention?

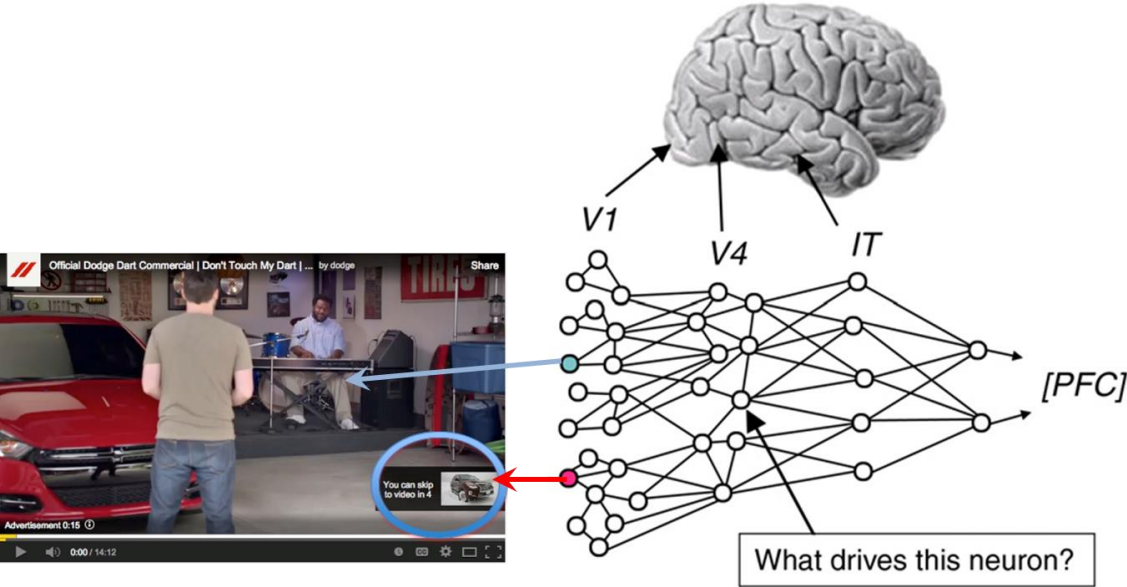


Figure 1-1. Competition in Skippable Pre-Roll Ad (Theeuwes, 2010)

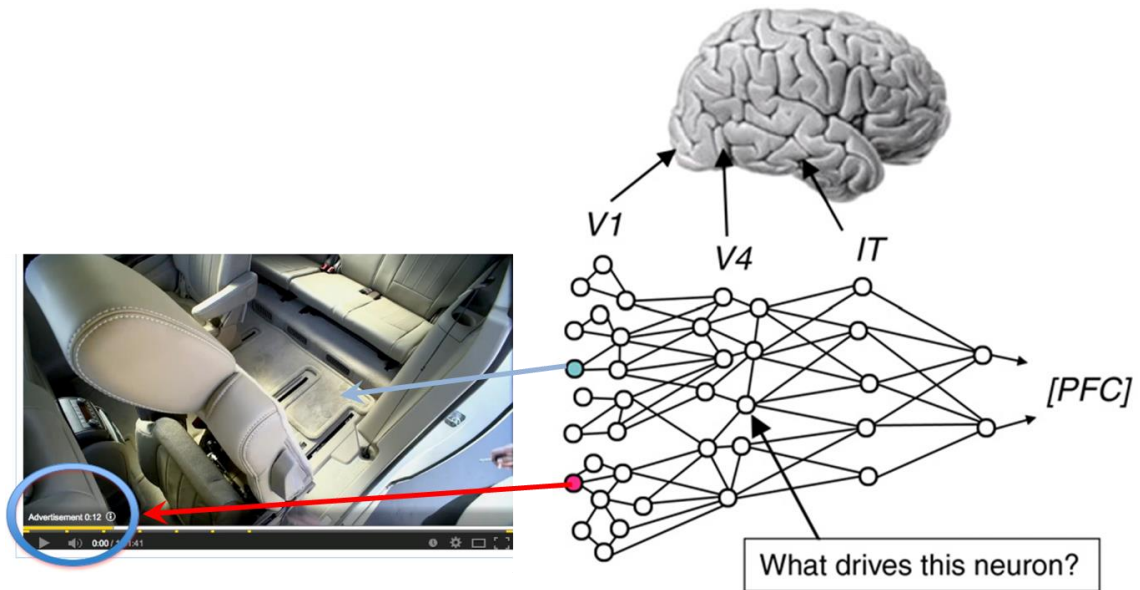


Figure 1-2. Competition in Unskippable Pre-Roll Ad (Theeuwes, 2010)

Based on the bottom-up process, if the ad content is animated, in full-screen and is salient, attention may be directed to the ad content. On the other hand, if a differently shaped skip button stands out from the background or is located at the edge of the screen, it may also receive attention priority. It is hard to anticipate which of these two objects would win a user's attention. However, the running time of the ad differs from the skip button in terms of salience. It is naturally included in the frame of the ad screen and does not stand out with a heterogeneous shape, color or size.

With respect to the top-down process, the goal of the observer is to watch a free online video. The goal-relevant object would be the skip button that helps the observer achieve the goal (viewing the video) in five seconds. Thus, the skip button may be superior to ad content in the competition for attention. However, if the observer has internal expectations of what he/she will experience from the ad, such as being informed or being entertained, an attentional effect may occur on the ad content, not the

skip button. Similar to the skip button, the running time of the ad also may be a goal-relevant object because attending to that would reflect the observer's desire to watch the main video more quickly. On the other hand, the psychological acceptance of the situation in which the ad cannot be skipped may bring an unexpected attentional effect, such as involuntarily attending to a 15- or 30-second ad in full.

General Attitudes toward Advertising as Covariate

As mentioned earlier, the main goal of online video users is simply to watch online videos thus, the skip button or the running time of the ad is considered goal-relevant. However, the current study suggests the role of users' *general attitudes toward advertising* as another influential factor for paying attention to the skip button or the ad's running time. There is a possibility that users do not only pay attention to the skip button or the running time of the ad as goal-relevant objects, but they also do so because they simply dislike advertising itself. In other words, due to general negative attitudes toward advertising itself, but not due to any specific attitude toward the particular pre-roll advertisement, users may tend to pay more attention to the skip button or the running time of the ad than to the ad content. Many studies on ad avoidance argue that ad avoidance occurs as a result of attitudes toward advertising. Cronin and Menelly (1992) found that people tended to avoid a commercial as soon as they recognized its occurrence, not relative to any specific ad content. Abernethy (1991) noted that most subsequent television commercials were avoided as the choice was made to avoid during the first ad in a sequence. Speck and Elliott (1997) argued that as long as people are given a means to avoid commercials, they do just that. Tying back to the current study, online video viewers are likely to attend to the skip button or the running time of

the ad, not only for their goal achievement (watching a video) or its allure but also just because they do not like advertising. The effect of general attitude toward advertising is expected as a covariate to attention.

No previous studies have been conducted to apply both bottom-up and top-down factors to resolve attention competition in online advertising contexts. Therefore, the current study attempts to examine which attention mechanism works in the conditions of skippable and non-skippable pre-roll advertising.

H1-1. Free-online-video viewers who encounter a pre-roll ad with the skip button pay more attention to the skip button on the ad than to the ad content, after controlling for general attitudes toward advertising.

H1-2. Free-online-video viewers who encounter a pre-roll ad without the skip button pay more attention to the running time of the ad than to the ad content, after controlling for general attitudes toward advertising.

H1-3. Free-online-video viewers pay more attention to ad content on an unskippable pre-roll ad than on a skippable pre-roll ad, after controlling for general attitudes toward advertising.

RQ1. Which factor of bottom-up and top-down processes affects viewers' attention for both pre-roll ads with the skip button and without it?

The Effect of Skip Function on Recall of Ad Content

Recall is an effective tool to predict ad effectiveness (Mitchell, 1993; Thorson et al., 1992). In order for an advertising message to achieve its goal of audience persuasion, attention alone is not enough; audiences must also process what they have seen (Wedel & Pieters, 2000). However, without attention, no further processing can occur to affect

subsequent audience decision-making. Correspondingly, more attention leads to more opportunity to decode and store messages; and a positive relationship between attention and memory has been found by a number of attention studies (Goodrich, 2011; Intraub, 1979; Loftus & Kallman, 1979; Pieters, Warlop, & Wedel, 2002). It can also be inferred from many ad repetition studies (Kirmani, 1997; Yaveroglu & Donthu, 2008) that more attention would yield higher memory performance.

There is an important issue in the context of pre-roll advertising: exposure time. After attention, viewers would have 15 seconds of guaranteed time to learn and remember ad content in the unskippable ad unless they avoid the commercial on purpose. However, in the case of a skippable ad, viewers may have only five seconds to put ad content into the memory system if the ad is skipped. This is not enough exposure time to learn ad content. Moreover, according to a report by the Wall Street Journal, many advertisers simply adapt or recycle their existing 30-second TV commercials for use in pre-roll ads online (Marshall, 2014). Those commercials are designed specifically for use on TV, but are less optimized to use as a pre-roll ad on the web. Therefore, it does not seem that five seconds are enough to carry the desired message to an audience.

The Effect of Exposure Time on Recall

Many studies have reported exposure effectiveness using the length of time that audiences spend consuming a medium. In terms of the traditional television medium, time-spent-viewing studies have noted that the longer an audience is attending to an advertisement, the more embedded ad content tends to be remembered (Krugman, Cameron, & McKearney, 1995; Swallen, 2000). Other television studies have revealed that advertisements with longer durations tend to lead to higher memory retention

scores than shorter versions (Patzner, 1991; Pieters & Bijmolt, 1997; Singh & Cole, 1993; Singh, Rothschild, & Churchill, 1988; Wheatley, 1968).

The link between attention to advertising and viewing duration is closely related to audience information processing of ad content. Many information processing theories emphasize that effectively processing the content of an informative stimulus is essential if any meaningful processing is going to take place (MacInnis, Moorman, & Jaworski, 1991; Meyers-Levy, & Malaviya, 1999). For information processing to occur, audiences must be given a meaningful opportunity to process advertising, which can come through spending more time attending to the advertising. This notion has been demonstrated empirically where, for example, increased camera shot-length times in advertising have been shown to positively influence recognition of those particular shots (Rossiter, Silberstein, Harris, & Nield, 2001). In other words, the longer a scene is in an advertisement, the higher the likelihood that the scene would be recognized in subsequent memory tests.

In the case of the Internet, the webpage exposure duration (i.e., the period of time spent viewing a webpage) seems to be an intuitive starting point for evaluating exposure quality. A longer visit duration could lead to more opportunity for various marketing exposures in that the longer users spend looking at a webpage, the more likely they are to at least notice ad content, be it a brand, a link to another website or some other promotional offers (Sherman & Deighton, 2001; Swallen, 2000).

In context of the current study, it can be inferred that the skip function in pre-roll advertising would affect viewers' recall of ad content in two ways. First, based on the earlier studies non-skippable pre-roll advertising, which is likely to have a longer

exposure time, would lead viewers to have better memory performance. In other words, skippable pre-roll advertising may provide viewers with shorter exposure time in which to learn and to remember ad content, assuming that it is skipped. Second, considering the relationship between attention and recall (Goodrich, 2011; Intraub, 1979; Kirmani, 1997; Lee & Ahn, 2012; Loftus & Kallman, 1979; Pieters et al., 2002; Yaveroglu & Donthu, 2008), it is expected that non-skippable pre-roll advertising would have more opportunity to grab audiences' attention and thus, would lead to viewers' strengthened memory performance. However, as mentioned earlier, according to the competitive attention model (Desimone & Duncan, 1995), there are visual competitors (i.e., the skip button and running time of an ad) that may interrupt viewers' attention on both skippable and non-skippable advertising, either in the top-down or bottom-up approach. Intuitively, although non-skippable advertising is likely to have more potential to lead to better recall, the running time of the ad may still work as a distractor to ad attention. The current study proposes the following hypothesis:

H2. Free-online-video viewers who encounter a pre-roll ad without the skip button have better memory performance than those who encounter a pre-roll ad with the skip button, after controlling for general attitudes toward advertising.

Negative Psychological Factors in Pre-Roll Advertising

In addition to attention and recall issues for pre-roll advertising, it is expected that viewers' negative psychological responses would occur in a dominant manner because of forceful exposure to the ad. Several ad avoidance or ad reactance studies have shown consideration to two representative constructs as predictors: perceived intrusiveness and perceived irritation (Edwards et al., 2002; Li et al., 2002). In addition

to traditional online advertising formats, such as banner ads and pop-up ads, pre-roll advertising embedded in online video clips like the current study focuses on are another typical intrusive and irritating type of ad. Based on Brehm's (1966) psychological reactance theory, the current study compares viewers' negative psychological responses to skippable and non-skippable pre-roll advertising, which can postulate the effect of the skip function.

Perceived Intrusiveness and Irritation

The extent to which consumers seek freedom has a positive association with the perception of advertising as an intrusive threat to that freedom (Edwards et al., 2002). The concept of intrusiveness is defined as "the degree to which advertisements in a media vehicle interrupt the flow of an editorial unit" (Ha, 1996, p. 77). That is, the construct of perceived intrusiveness refers to the degree to which advertising interrupts consumers' goals. In this study's context, both skippable and non-skippable pre-roll ads intrude before main content videos and inhibit the viewers' goal (i.e., watching a video). However, the skip function may alleviate the extent to which viewers sense this intrusiveness because it would give viewers the opportunity to avoid the intrusive ad and to achieve their goal (watching a video clip) more quickly.

While intrusiveness refers to consumers' cognitive evaluations, the concept of irritation should be considered as an emotional assessment of advertising value (Li et al., 2002). Prior empirical research on ad avoidance regarded perceived irritation as an outcome measure and showed a linear relationship from perceived intrusiveness to irritation (Edwards et al., 2002; Li et al., 2002). In the current context, this causal relationship can assume that the more intrusive a pre-roll ad is perceived to be, the more

irritating the ad is also perceived as. Similar to the perception of intrusiveness, the skip function may lessen the perception of the ad as being irritating because viewers are less likely to feel irritation by skipping the intruded ad. Thus, the following hypothesis is postulated:

H3. Free-online-video viewers feel a higher level of perceived (a) intrusiveness and (b) irritation toward a pre-roll ad without the skip button than one with the skip button, after controlling for general attitudes toward advertising.

Psychological Reactance to Forced Pre-Roll Ads

According to psychological reactance theory (Brehm, 1966), individuals become psychologically reactant when they perceive their behavioral freedoms are threatened or reduced. The reactance results in attempts to restore the threatened freedom. When a perceived freedom is threatened or eliminated, the extent of reactance is assumed to be a direct result of how aware individuals are of having the freedom to engage in that particular behavior. Thus, reactance in its trait form refers to a personality attribute with levels of reactance varying among individuals who consider their behaviors as solely their own business and tend to strongly reject persuasive appeals directed toward controlling their behaviors.

In the context of the current study, free-online-video users would feel psychological reactance when they are intruded upon and irritated by the forced pre-roll ads. Particularly, users are likely to perceive more threat to freedom when exposed to non-skippable pre-roll ads. However, users are likely to feel a lesser degree of reactance in response to skippable pre-roll ads, which give users an opportunity to restore the

threatened freedom via the skip button, even though they are forced to view the ads for at least five seconds.

H4. Free-online-video viewers feel a higher level of perceived freedom threat toward a pre-roll ad without the skip button than toward one with the skip button, after controlling for general attitudes toward advertising.

If free-online-video users perceive higher levels of threatened freedom, intrusiveness, and irritation toward non-skippable pre-roll advertising, they may also have more negative attitudes toward it. Therefore, the following hypothesis is proposed:

H5. Free-online-video viewers have a more positive attitude toward a pre-roll ad with the skip button than that without the skip button, after controlling for general attitudes toward advertising.

Methodology

Study 1 employs a between-subjects and within-subjects experimental design with a self-administered survey to test the proposed hypotheses. The purpose of Study 1 is to investigate the differences in participants' cognitive and attitudinal responses toward skippable and unskippable pre-roll advertising — the comparison of attention dispersed within each ad and the comparison of attention, recall, and perceptions between the ads. Therefore, the current experimental design is appropriate to examine the causal effects of the skip function on participant responses. The experiment consists of three different groups: Group 1, who watches an unskippable pre-roll advertisement (with the running time of the ad available); Group 2, who watches a skippable pre-roll advertisement (with the skip button available); and Group 3, who is controlled without

the skip button or the running time of the ad available. Details on the sample, experimental stimuli, procedures, and measurement are as follows.

Sample

Data were collected from Amazon's Mechanical Turk (MTurk), a site for Web-based data collection. Since MTurk samples have been used for social science experiments, many researchers have explored their generalizability and validity and generally reported that the available MTurk sample does not perfectly match all relevant characteristics of the U.S. population, but that does not mean it is misrepresentative either (Berinsky, Huber, & Lenz, 2012; Buhrmester, Kwang, & Gosling, 2011; Horton, Rand, & Zeckhauser, 2011; Paolacci, Chandler, & Ipeirotis, 2010). Rather, a study by Buhrmester et al. (2011) showed that MTurk samples are more demographically diverse than are standard Internet samples and are significantly more diverse than typical American college samples. More specifically, participants in MTurk samples came from all fifty U.S. states, and gender splits were more balanced (55% female) than standard Internet samples. Also MTurk samples were greater in the percentage of non-White (36%) and non-American (31%) participants, than the ratio in standard Internet samples (23% and 30%, respectively). Moreover, in terms of age distribution, which seems to be restricted to younger respondents due to the nature of paid Web-based data collection, MTurk samples were older ($M = 32.8$ years, $SD = 11.5$) than standard Internet samples ($M = 24.3$ years, $SD = 10.0$). MTurk is deemed appropriate for the current study because its data can represent various age groups of the online video viewing population. According to a study by YuMe and IPG Media Lab, the use of online video is not confined to younger generations; rather, it is expanding across all ages (eMarketer.com,

2013). More specifically, while 37% of viewers aged 18 to 34 watched TV shows online, 26% of those aged 35 to 54 and 16% of those aged 55 or older watched them online as well. Online videos in all other content categories also were likely to be viewed in all age groups (e.g., 28% for movies, 19% for music videos, and 33% for other short clips in the 18-34 group; 20%, 10%, and 21% in the 35-54 group; 14%; 5%; and 15% in the 55+ group).

Fifty participants per group completed the online survey from Qualtrics, an online research platform. G*Power showed that a total of one-hundred-twenty-seven participants (forty three participants in each group) were needed to achieve 80% power at two-sided 5% significance level. Each participant was given 50 cents through the MTurk system, which she or he was linked to via the Qualtrics online survey (See Appendix A). The criterion that made 50 cents the optimum incentive to participate gains its validity from Buhrmester et al.'s (2011) study. This study investigated the effects of compensation amount and task length on participation rates and the impact of compensation amount on data quality. Crossing three different compensation levels (two, 10, and 50 cents) with three different task-completion times (five, 10, and 30 minutes), they revealed the highest participation rate in the 50-cent and five-minute condition and the lowest one in the two-cent and 30-minute condition. Computing alpha reliabilities for data collected at three levels of compensation (two, 10, and 50 cents), they found that the mean alphas were within one hundredth of a point across the three different levels, which indicates no effect of compensation amount on data quality. Based on these results, the current study adopted the 50-cent compensation that seems reasonable in raising the participation rate without concern of data quality.

Due to the nature of the public online survey system, there may be a possibility of repeated sample, but a software program offered by Qualtrics is set up to keep a participant from taking the survey more than once. As determined by the researcher's pre-survey questions, all respondents were regular online video users and have experienced pre-roll ads with and without the skip button. In addition, for the effect of the skip function (e.g., more elaborated differences of exposure time between Group 1 and 2), the sample of Group 2 was sorted only with those who, indeed, skipped the ad in the current experiment. Thus, the survey included the following question: "Did you skip the ad you've just watched?"

Stimulus

Experimental stimuli of Study 1 consisted of three different formats of 15-second pre-roll advertisements for each group, followed by a 1-minute and 53-second movie trailer. While the advertisement for Group 1 displayed the running time of the ad at the bottom left of the screen (<https://youtu.be/8zCEzyD4qp0>), the ad for Group 2 showed the skip button at the bottom right, which could only be activated after a minimum of five seconds (<https://youtu.be/2b4rJRc6OLA>). The ad for Group 3 (control group) had neither of these two functions (<https://youtu.be/r2MQEkgQ3F4>). All stimuli followed the basic format of existing YouTube pre-roll ads and were uploaded on *YouTube.com*. An advertisement produced by "HomeAway.com," an online-based marketplace for vacation rentals, was selected (See Figure 2-1, 2-2, and 2-3). Two important criteria in selecting the ad stimulus were involvement and familiarity. Zinkhan and Muderrisoglu (1985) point out that involvement, which has a strong correlation with familiarity, is a positive predictor of ad attention and recall. In order to

control the participants' bias toward the stimulus, an advertisement satisfying both conditions—a less familiar brand and less involved product category—was selected. Vacation rental is a very specifically targeted product and the brand HomeAway is relatively young, only established in 2006. Zinkhan and Muderrisoglu (1985) argued that the more targeted the product is, the less involved the product is, which is less popular across generations and gender. The trailer of the film “Big Hero 6,” an American family animation produced by Walt Disney in 2014, was used as a basic video clip in which the pre-roll ad was embedded.



'Big Hero 6' Trailer

Figure 2-1. Ad Stimulus for Group 1



'Big Hero 6' Trailer

Figure 2-2. Ad Stimulus for Group 2



'Big Hero 6' Trailer

Figure 2-3. Ad Stimulus for Control Group

Procedure

Respondents who agreed to participate in the study — called MTurk workers — were given the website address for an experiment and survey (https://ousurvey.qualtrics.com/SE/?SID=SV_cTlgJwvosZrEqhv). To obtain unbiased responses about pre-roll advertising, the current study was introduced as a study on use of free online video websites, without mentioning pre-roll advertising (See Appendix A). Participants were directed to a hyperlink for the video clip of the movie trailer, which linked to *YouTube.com* in a new window. The participants were randomly assigned into three groups by software called “Randomizer” available within Qualtrics. The software randomly assigned the participants into three different versions of the experimental stimulus and its corresponding questionnaire, until one hundred fifty people were placed evenly into three groups. Group 1 was exposed to a non-skippable pre-roll ad embedded in the movie trailer clip, Group 2 was exposed to a skippable pre-roll ad, and Group 3 encountered a normal pre-roll ad without either the skip button or the ad running time. After the participants were shown the entire video clip, they were asked to close the YouTube window and return to the survey questionnaire. To prevent the participants from advancing to the survey questionnaire without watching the video clip, the timer function was set in the page including the hyperlink to the video clip, which let the researcher record and manage how long a participant spends on that page. For Group 1 and 3, the next button was not activated until 2 minutes 8 seconds later (i.e., 15 seconds for the ad + 1 minute 53 seconds for the movie trailer). Group 2 was supposed to stay on the page for at least 1 minute 58 seconds (i.e., 5 seconds for the ad + 1 minute 53 seconds for the movie trailer) because the participants who did not skip the ad would be

excluded from the sample. They were then asked to answer the questionnaire about their perceptions of the ad experience.

Measurement

In terms of the context of the pre-roll ad without the skip button, a total of eight constructs were assessed — attention to the ad, attention to the running time of the ad, recall of the ad content, perceived intrusiveness, perceived irritation, perceived threatened freedom, attitude toward the ad, and general attitude toward advertising. Except recall of the ad content, all items were measured with 7-point Likert scales, ranging from 1 (strongly disagree) to 7 (strongly agree). Intrusiveness was measured using seven items: distracting, disturbing, forced, interfering, intrusive, invasive, and obtrusive (Li et al., 2002). Irritation consisted of five items: irritating, phony, ridiculous, stupid, and terrible (Wells, Leavitt, & McConville, 1971). The construct of perceived threatened freedom was measured using three items: (1) I felt the ad infringes on my freedom; (2) I felt my freedom is threatened; (3) The ad forced me to respond (Edwards et al., 2002). The measure of attention consisted of three items adapted from Muehling, Stoltman, and Grossbart's (1990) study, which reflected the amount of attention paid to the ad and to the running time of the ad: (1) I paid attention to the ad / the running time of the ad; (2) I noticed the ad / the running time of the ad; (3) I concentrated on the content of the ad. Attitude toward the stimulus ad was measured by the semantic differential scales: good/bad, favorable/unfavorable, and positive/negative (Muehling, 1987). General attitude toward advertising was measured using three items: (1) Overall I find advertising positive; (2) Overall I feel favorable toward advertising; (3) Overall I like advertising (MacKenzie, Lutz, & Belch (1986). With respect to the context of the

pre-roll ad with the skip button, attention to the skip button was measured instead of attention to the running time of the ad by three items: (1) I paid attention to the skip button; (2) I noticed the skip button; (3) I concentrated on the skip button. To measure recall of each ad, a total of five questions about the content of the ad were asked: (1) What the name of brand was; (2) What the category of product was; (3) What the ad copy was; (4) What the first word shown in the ad was; (5) Where the setting of the first scene was. It was measured on a six-point cumulative scale from 0 to 5, based on the sum of correct answers, which was used as a continuous variable. For Research Questions 1 (Which factor of bottom-up and top-down processes affects viewers' attention for both pre-roll ads with the skip button and without it?), two open-ended questions were asked: "What brought your attention to the ad?" and "What brought your attention to the running time of the ad (for Group 1) / the skip button (for Group 2)?"

Measurement reliability was tested using factor analyses and Cronbach's alpha. All scales were found to be internally consistent. One component was extracted from all items for each variable. The statements of items and Cronbach's alphas are displayed in Table 1.

Table 1. *Summary of Measures*

Construct	Measures	Cronbach's Alpha
Attention to the ad	I paid attention to the ad.	.730 (time)
	I noticed the ad.	.759 (skip)
	I concentrated on the content of the ad.	.819 (control)
Attention to the running time / to the skip button	I paid attention to the running time of the ad / to the skip button.	.938 (time)
	I noticed the running time of the ad / the skip button.	.923 (skip)
	I concentrated on the running time of the ad / the skip button.	
Perceived Intrusiveness	Distracting/Disturbing/Forced/Interfering/Intrusive/ Invasive/Obtrusive	.925 (time)
		.899 (skip)
		.934 (control)
Perceived Irritation	Irritating / Phony / Ridiculous / Stupid / Terrible	.897 (time)
		.891 (skip)
		.924 (control)
Perceived threatened freedom	I felt the ad infringes on my freedom.	.730 (time)
	I felt my freedom is threatened.	.744 (skip)
	The ad forced me to respond.	.720 (control)
Attitude toward the ad	Bad-Good	.974 (time)
	Unfavorable-Favorable	.955 (skip)
	Negative-Positive	.967 (control)
General attitude toward advertising	Overall I find advertising positive.	.974 (time)
	Overall I feel favorable toward advertising.	.969 (skip)
	Overall I like advertising.	.969 (control)

Analysis

A series of analyses of covariance (ANCOVAs) were conducted to examine the differences of attention, recall, and other psychological factors between Group 1 (a pre-roll ad without the skip button), Group 2 (a pre-roll ad with the skip button), and the control group, controlling the effect of general attitudes toward advertising as covariate. A series of paired-samples t-tests were conducted to investigate the differences of attention between the ad content and the running time of the ad (within Group 1) and between the ad content and the skip button (within Group 2). To answer Research

Question 1, the constant comparative method was used: representative categories were drawn from respondents' statements, coded into numerical values, and frequency-analyzed (Denzin & Lincoln, 2005).

Results

Data Screening

Outliers were checked with Mahalanobis Distance, which is “the distance of the case from the centroid of the remaining cases where the centroid is the point created by the means of all the variables” (Tabachnik & Fidell, 2001, p. 67). The cases with $p < .05$, a total of 28 cases, were deleted from the sample. After outliers were checked, the normality and linearity of the data were checked and confirmed.

Descriptive Statistics

After data screening, 122 participants were valid for the data analysis out of 150 responses from the survey. Of these 122 participants, 34 belonged to Group 1, who watched the unskippable pre-roll ad with the running-time bar below the video clip, 42 represented Group 2, who was exposed to the skippable pre-roll ad, and 46 were the control group.

For Group 1, 20 were female (58.8%) and 14 were male (41.2%). A t-test was conducted to confirm a possible bias from the unbalanced gender distribution. There was no significant difference. The average age of the participants was 38.80 (SD = 12.16) and ranged from 22 to 78. With respect to the use of online video, participants watched free online videos for an average of 6.64 hours per week (SD = 10.02), with a range from 0 to 50 hours per week. The mean value of the frequency in which participants skip pre-roll ads was 5.54 (SD = 1.421) and it was measured with 7-point

scales, ranging from 1 (never) to 7 (every time). The website participants most frequently visit to watch free streaming videos was YouTube.com (88.2%) and the favorite video type was short clips (32.3%).

For Group 2, 20 were female (47.6%) and 22 were male (52.4%). The average age of the participants was 35.60 (SD = 11.34) and ranged from 21 to 60. Regarding the use of online video, participants watched free online videos for an average of 7.20 hours per week (SD = 8.83), with a range from 30 minutes to 35 hours per week. The mean value of the frequency in which participants skip pre-roll ads was 6.17 (SD = 1.146), ranging from 1 (never) to 7 (every time). The website participants most frequently visit to watch free streaming videos was YouTube.com (83.3%) and the favorite video type was short clips (35.7%). In the case of Group 2, who watched the ad stimulus with the skip function, the participants were asked whether or not they skipped the ad. About 75% of the group actually skipped the ad in the current experiment.

For Group 3 (control group), 26 were female (56.5%) and 20 were male (43.5%). Another t-test was conducted to confirm a possible bias from the unbalanced gender distribution and there was no significant difference. The average age of the participants was 34.96 (SD = 9.89) and ranged from 22 to 59. In terms of the use of online video, participants watched free online videos for an average of 7.62 hours per week (SD = 7.75), with a range from 1 to 35 hours per week. The mean value of the frequency in which participants skip pre-roll ads was 6.07 (SD = 1.237), ranging from 1 (never) to 7 (every time). The website participants most frequently visit to watch free streaming videos was YouTube.com (82.6%) and the favorite video type was short clips (28.3%). The summary is displayed in Table 2.

Table 2

Demographics of Groups

	Group 1	Group 2	Group 3
Gender Ratio (f vs m)	58.8% vs. 41.2%	47.6% vs. 52.4%	56.5% vs. 43.5%
Age Distribution	22 to 78 (M=39)	21 to 60 (M=36)	22 to 59 (M=35)
Online Video Use	6.64 (h/week)	7.20 (h/week)	7.62 (h/week)
Skip Frequency (1-7)	5.54	6.17	6.07
Favorite Website	YouTube (88.2%)	YouTube (83.3%)	YouTube (82.6%)
Favorite Video Type	Short clips (32.3%)	Short clips (35.7%)	Short clips (28.3%)

Hypotheses Testing

A series of hypotheses consider different levels of attention paid to the ad content or the skip button on the ad (H1-1), to the ad content or the running time of the ad (H1-2), to the ad content between the pre-roll ad with the skip button and without it (H1-3), and different levels of ad recall among different groups (H2). Research question 1 deals with factors affecting attention. Another series of hypotheses predict viewers' different perceptions of intrusiveness (H3a), irritation (H3b), threatened freedom (H4), and attitude (H5) between the ad with the skip button and without it. A paired samples t-test, a series of ANCOVAs, and a frequency analysis were conducted to test these hypotheses and the research question.

Differences in attention. Hypothesis 1-1 posited that free-online-video viewers who encounter a pre-roll ad with the skip button would pay more attention to the skip button on the ad than to the ad content. As seen in Table 3, a paired samples t-test revealed a significant difference between attention to the skip button and attention to the ad ($t = -19.198$, $df = 41$, $p < .001$). The sample paid more attention to the skip button on the ad ($M = 6.45$, $SD = .81$) than to the ad content ($M = 1.90$, $SD = .95$). H1-1 was

supported. Hypothesis 1-2 postulated that free-online-video viewers who encounter a pre-roll ad without the skip button would pay more attention to the running time of the ad than to the ad content. There was also a significant difference between attention to the running time and attention to the ad ($t = -2.392, df = 33, p < .05$). As expected, the running time of the ad ($M = 3.59, SD = 2.07$) grabbed more viewer attention than did the ad content ($M = 2.75, SD = 1.35$). H1-2 was supported.

Table 3

Differences of Attention within Groups

Group	Pair	Mean	SD	$t (df)$
Group 1	Attention to ad /	2.75	1.35	-2.392 (33)*
	to running time	3.59	2.07	
Group 2	Attention to ad /	1.90	.95	-19.198 (41)***
	to skip button	6.45	.81	

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

Hypothesis 1-3 posited that free-online-video viewers would pay more attention to ad content on an unskippable pre-roll ad than on a skippable pre-roll ad, after controlling for general attitudes toward advertising. As seen in Table 4, the result of an ANCOVA showed the significant differences in participants' attention to ads among three groups ($F(2, 118) = 8.688, p < .001, \eta^2 = .128$). There was a significant effect of the covariate of general attitude toward advertising ($F(1, 118) = 13.675, p < .001$). The mean of ad attention in the control group was the highest ($M_{\text{Control}} = 2.95, SD = 1.34$), followed by the running-time group ($M_{\text{Time}} = 2.75, SD = 1.35$) and then the skip-button group ($M_{\text{Skip}} = 1.90, SD = .95$).

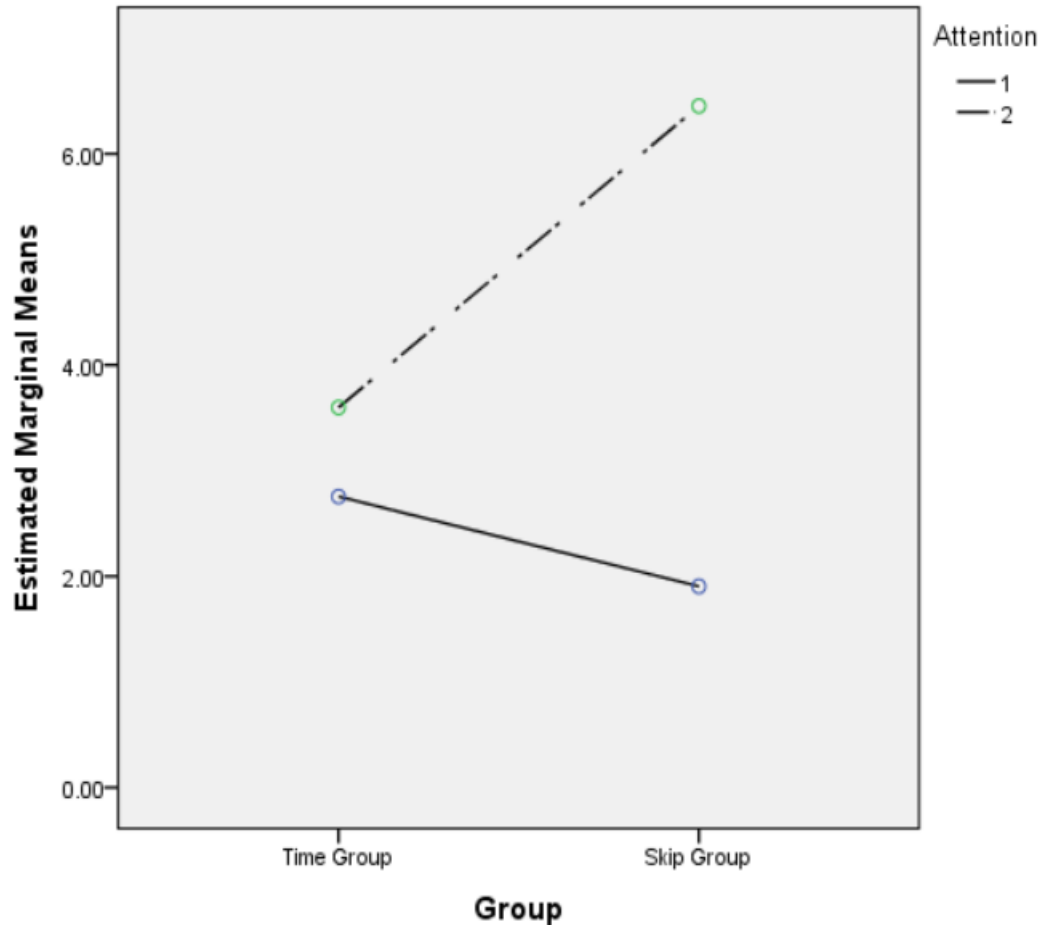
Table 4

ANCOVA among Three Groups on Ad Attention

Source	Type III Sum of		Mean			Partial Eta Squared
	Squares	df	Square	F	Sig.	
Overall Attitude	18.583	1	18.583	13.675	.000	.104
Group	23.611	2	11.806	8.688	.000	.128
Error	160.353	118	1.359			
Total	985.556	122				

A post hoc Scheffe's test presented that there were significant mean differences between the skip-button group and the control group ($p < .001$), and between the skip-button group and the running-time group ($p < .01$); however, no significant difference was found between the running-time group and the control group. H1-3 was supported.

The following figure describes the results of a within-subjects and between-subjects test. It was confirmed that the gap between attention to the ad and attention to the skip button was much greater than the gap between attention to the ad and attention to the running-time bar, which indicates that the skip button was a more interruptive element of viewers' ad attention than the running-time bar. Accordingly, the figure showed a lower level of attention to the skippable ad than attention to the unskippable ad.



Note: — Ad attention
 ----- Time/Skip attention

Figure 3. The Effects of Time/Skip Attention on Ad Attention

A main attention-affecting factor. To answer RQ1 (Which factor of bottom-up and top-down processes affects viewers’ attention for both pre-roll ads with the skip button and without it?), the current study analyzed the participants’ statements followed by the open-ended questions, “What brought your attention to the ad or the running-time of the ad?” for Group 1, “What brought your attention to the ad or the skip button?” for Group 2, and “What brought your attention to the ad?” for the control group. As seen in the results of H1-1 and H1-2, the participants in both Group 1 and 2

paid more attention to the running-time bar and the skip button than to each ad. Their statements drawn from the open-ended questions were sorted in several representative categories.

In terms of ad attention, few people paid attention to each ad in all three groups; therefore, representative categories about the question “What brought your attention to the ad?” could not be sorted. Only two out of thirty-four people in the running-time group answered that they did pay attention to the ad because both were bored with waiting for fifteen seconds, so just watched the ad very passively. In case of the skip-button group, none of forty-two answered that they did pay attention to the ad. Only four out of forty-six in the control group answered that they did pay attention to the ad because there was nothing to do for fifteen seconds except watching the ad. Similar to the running-time group, it was not the active ad pursuit but the passive exposure to the ad.

Regarding attention to the running-time bar, two representative categories were sorted from a total of thirty-four statements: (1) waiting and (2) avoiding. In specific, eighteen out of thirty-four participants (52.94%) paid attention to the running-time bar of the ad so that they could know how much time they had to wait to see the main video clip. Twelve out of thirty-four (35.29%) did so because they just wanted to avoid the ad. Only four (11.77%) paid no attention to the running-time bar, which does not mean that they paid more attention to the ad.

With respect to the skip-button attention, three different types of responses were classified from a total of forty-two statements: (1) skipping, (2) prior experience, and (3) pop-out effect. Twenty-three out of forty-two respondents (54.76%) paid attention to

the skip button so that they could skip the ad and watch the main video clip as soon as possible. Seventeen out of forty-two (40.48%) answered that they already knew through prior experience where the skip button is located. Only two (4.76%) were stimulated by the pop-out effect; more specifically, one stated, “It popped up on the screen,” and the other answered, “It was rather large and obvious.”

Differences in recall. Hypothesis 2 postulated free-online-video viewers who encounter a pre-roll ad without the skip button would have better memory performance than those who encounter a pre-roll ad with the skip button, after controlling for general attitudes toward advertising. This was based on the anticipation that the more exposed the sample was to the advertisement, the better memories individuals would have. An ANCOVA analysis (See Table 5) found a statistically significant difference among the three groups ($F(2, 118) = 10.037, p < .001, \eta^2 = .145$). The mean of recall scores in the running-time group was the highest ($M_{\text{Time}} = 1.03, SD = 1.24$), followed by the control group ($M_{\text{Control}} = .39, SD = .83$) and then the skip-button group ($M_{\text{Skip}} = .12, SD = .39$).

Table 5

ANCOVA among Three Groups on Ad Recall

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Overall Attitude	2.486	1	2.486	3.417	.067	.028
Group	14.604	2	7.302	10.037	.000	.145
Error	85.846	118	.728			
Total	132.000	122				

A post hoc Scheffe’s test presented that there were significant mean differences between the running-time group and the skip-button group ($p < .001$), and between the running-time group and the control group ($p < .01$); however, no significant difference

was found between the skip-button group and the control group. The general attitude toward advertising as a covariate had no effect on the recall score.

Differences in perceived intrusiveness. Hypothesis 3a posited that free-online-video viewers would feel a higher level of perceived intrusiveness toward a pre-roll ad without the skip button than one with the skip button, after controlling for general attitudes toward advertising. As seen in Table 6, although the general attitude toward advertising as a covariate had an influence on perception of intrusiveness ($F(1, 118) = 21.558, p < .001, \eta^2 = .154$), significant differences were revealed among the three groups ($F(2, 118) = 7.388, p < .01, \eta^2 = .111$). However, contrary to the expectation, the sample who watched the ad with the skip button felt the highest level of perceived intrusiveness ($M_{\text{Skip}} = 5.14, SD = 1.13$), followed by the control group ($M_{\text{Control}} = 4.61, SD = 1.39$) and the sample who watched the ad showing the running time ($M_{\text{Time}} = 3.89, SD = 1.51$).

Table 6

ANCOVA among Three Groups on Perceived Intrusiveness

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Overall Attitude	33.353	1	33.353	21.558	.000	.154
Group	22.860	2	11.430	7.388	.001	.111
Error	182.560	118	1.547			
Total	2818.204	122				

A post hoc Scheffe's test presented that the differences between the skip-button group and the running-time group ($p < .001$) and between the control group and the running-time group ($p < .05$) were statistically significant; however, no significant

difference was found between the skip-button group and the control group. H3a was not supported.

Differences in perceived irritation. Hypothesis 3b postulated that free-online-video viewers would feel a higher level of perceived irritation toward a pre-roll ad without the skip button than one with the skip button, after controlling for general attitudes toward advertising. An ANCOVA analysis (See Table 7) found different perceptions of irritation among the three groups ($F(2, 118) = 6.317, p < .01, \eta^2 = .097$). Contrary to the prediction, the skip-button group felt the highest level of perceived irritation toward the pre-roll ad ($M_{\text{Skip}} = 4.41, SD = .64$), followed by the control group ($M_{\text{Control}} = 4.00, SD = 1.39$) and the running-time group ($M_{\text{Time}} = 3.43, SD = 1.26$).

Table 7

ANCOVA among Three Groups on Perceived Irritation

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Overall Attitude	27.852	1	27.852	25.574	.000	.178
Group	13.758	2	6.879	6.317	.002	.097
Error	128.510	118	1.089			
Total	2110.640	122				

A post hoc Scheffe's test presented that there were statistically significant differences between the skip-button group and the running-time group ($p < .01$) and between the control group and the running-time group ($p < .05$); however, there was no significant difference between the skip-button group and the control group. Similar to the perception of intrusiveness, the effect of the covariate—general attitude toward advertising—was significant ($F(1, 118) = 25.574, p < .001, \eta^2 = .178$). H3b was not supported.

Differences in perceived freedom threat. Hypothesis 4 posited that free-online-video viewers would feel a higher level of perceived threat to freedom toward a pre-roll ad without the skip button than toward one with the skip button, after controlling for general attitudes toward advertising. An ANCOVA analysis (See Table 8) revealed statistically significant differences among the three groups ($F(2, 118) = 4.456, p < .05, \eta^2 = .070$). However, unexpectedly, the mean of perceived threat to freedom in the skip-button group is the highest ($M_{\text{Skip}} = 2.67, SD = 1.32$), followed by the control group ($M_{\text{Control}} = 2.35, SD = 1.27$) and the running-time group ($M_{\text{Time}} = 1.84, SD = 1.01$).

Table 8

ANCOVA among Three Groups on Perceived Threatened Freedom

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Overall Attitude	.467	1	.467	.310	.579	.003
Group	13.444	2	6.722	4.456	.014	.070
Error	178.005	118	1.509			
Total	849.556	122				

A post hoc Scheffe's test presented that there was a significant mean difference between the skip-button group and the running-time group ($p < .05$); however, no significant differences were found between the skip-button group and the control group and between the running-time group and the control group. The general attitude toward advertising as a covariate had no effect on the perception of freedom threat. H4 was not supported.

Differences in attitude toward the ad. Hypothesis 5 postulated that free-online-video viewers would have a more positive attitude toward a pre-roll ad with the

skip button than without the skip button, after controlling for general attitudes toward advertising. As seen in Table 9, not like the expectation, no significant differences were found among three groups ($F(2, 118) = 1.936, p > .05, \eta^2 = .032$).

Table 9

ANCOVA among Three Groups on Attitude toward the Ad

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Overall Attitude	26.332	1	26.332	15.223	.000	.114
Group	6.699	2	3.349	1.936	.149	.032
Error	204.115	118	1.730			
Total	1566.778	122				

A post hoc Scheffe's test confirmed that no significant differences between the skip-button group ($M_{\text{Skip}} = 2.95, SD = 1.21$) and the running-time group ($M_{\text{Time}} = 3.66, SD = 1.54$), between the skip-button group and the control group ($M_{\text{Control}} = 3.35, SD = 1.43$), and between the running-time group and the control group. H5 was not supported.

Discussion

Study 1 was designed to investigate visual attention processing in (1) skippable pre-roll advertising with the skip button, (2) unskippable pre-roll advertising with the running time of the ad, and (3) unskippable pre-roll advertising with neither the skip button nor the running time, and compare different perceptions of and attitudes toward these two different formats of advertising. This study established the theoretical rationales of a research question and several hypotheses from the neurophysiological perspective and social psychological theory. The analyses identified the effects of the skip function in pre-roll advertising and offer several implications for the effectiveness

of skippable/unskippable pre-roll advertising. In this section, theoretical interpretations of the results and their practical applications will be discussed.

Attention Competition between Ad and Other Visual Objects on the Ad

As expected from the result of Hypothesis 1-1 (higher attention to the skip button than to the ad), the ad attention in the control group, who was exposed to nothing but the advertisement, was higher than in the skip-button group. This implies that the skip button, located at the right bottom of the screen, interrupted the participants' attention to the ad. Based on the results of Hypothesis 1-2 (higher attention to the running-time bar than to the ad), the ad attention in the control group might have been higher than in the running-time group, but the difference was not statistically significant. This indicates that the running-time bar of the ad located at the bottom of the screen might not be a variable affecting the ad attention. This seems contradictory to the result of Hypothesis 1-2. Similar to the difference between the control group and the skip-button group, the participants in the running-time group paid more attention to the ad than did those in the skip-button group. That is, the skip button on pre-roll advertising is more likely to interrupt audiences' ad attention. The specific numbers of each mean value offer clearer understanding of these differences among groups. For example, the mean value of the skip-button attention was 6.45 while the mean value of the ad attention was 1.90, ranging from 1 to 7, which shows a decided difference in attention level. On the other hand, the difference between attention to the running time and attention to the ad—3.59 versus 2.75—in the unskippable pre-roll advertising was not so great as was the difference between the skip-button attention and the ad attention. Although the difference between attention to the running-time bar and attention to the

ad was significant, the current study revealed little effect of the running-time bar on ad attention, compared to the control group without the skip button or the running-time bar. When free-online-video users are exposed only to a pre-roll advertisement without any objects interrupting attention, are they willing to pay more attention to the ad? The current participants' levels of ad attention were very low and similar in both the control group ($M_{\text{Control}} = 2.95$) and the running-time group ($M_{\text{Time}} = 2.75$).

In summary, examining the results of Hypothesis 1-1, 1-2, and 1-3, the current study identified three main points related to attention differences between skippable and unskippable pre-roll advertising. First, the skip button displayed on a skippable pre-roll ad may be the most competitive visual object to interrupt free-online-video viewers' ad attention. Second, the running-time bar of the ad may be a more attention-grabbing object than the ad content, but is not likely to interrupt viewers' ad attention as much as the skip button. Third, the result of ad attention in the control group shows that free-online-video viewers still dislike watching advertisements, regardless of whether or not there are obstacles to ad attention, and why the current study measured the effect of general attitude toward advertising as a covariate to attention.

Attention Mechanism: Bottom-up or Top-down factors?

Why do free-online-video users pay attention to the skip button or the running-time bar of the ad? Based on the bottom-up process, which refers to a more stimulus-based approach, although the ad is an object with a larger size and animated features, attention was directed to the skip button. The different shape of the skip button stood out from the background ad and might receive attention priority over ad content. Through the top-down process, which refers to a more consumer-based approach, users

were likely to target the skip button as a goal-relevant object, without being affected by the bottom-up factors. Moreover, because the samples in Group 2 watch free online videos for 7.2 hours a week on average and thus have enough pre-knowledge, users like the samples may tend to automatically pay attention to the skip button due to prior experience, which accomplishes their goal more quickly. In terms of Group 1, theoretically speaking, the running time of the ad won over the ad content in the competition for attention. From the bottom-up perspective, the running-time bar of the ad was naturally buried within the frame of the ad screen; however, the yellow color of the bar might attract viewers' visual attention. On the other hand, without being affected by the visual stimulation, the top-down process might work more actively. Attending to the running-time bar was likely to reflect the desire for the ad to be over and the patience to wait for the main video; thus, the running-time bar also may be a goal-relevant object.

These two different processes of visual attention can be predicted theoretically. To understand the attention mechanism better, the current study investigated which factor of bottom-up and top-down processes affected viewers' attention for both pre-roll ads with the skip button and without it. Based on their statements, over half of the participants in Group 1, who were exposed to the unskippable ad with the 15-second-running-time yellow bar, were influenced by the top-down factor. The participants' main goal was to watch the movie trailer, but they had to wait to achieve the goal for at least 15 seconds. According to their statements, indeed, the running-time bar of the ad helped them know how long they had to wait to see the movie trailer. In other words, the participants paid goal-oriented attention to the running-time bar. On the other hand,

another segment of the participants, reaching at about 35%, did not interpret the running-time bar as the goal-relevant object. These people stated that they attended to the running time of the ad because they just wanted to avoid the ad. It seems that, as a way of avoidance, they placed their eyes on the alternative object (e.g., the running-time bar) instead of watching the forced ad for 15 seconds. Although the goal of this attention is not to pursue the main video clip, the attention is still intentional on avoiding the ad. No one stated that bottom-up factors, such as the movement of and the color of the bar, affected attention to the bar.

Similar to Group 1, the respondents in Group 2, who were exposed to the skippable ad with the skip button, were affected by the top-down factor. 95.24% of this group paid goal-oriented attention to the skip button. More specifically, about 55% paid *functional attention* to the skip button in order to achieve the goal as soon as possible. The respondents were likely to conduct the inherent function of the skip button, skipping the ad. Another 40% paid *habitual attention* based on existing knowledge acquired by past experience. Miller and Cohen (2001) called it *repeated selection*. The pathway from stimulus to response would be strengthened by repeated selection, which ultimately automates the response. In the context of the current study, free-online-video users already know by past experience that the different shaped object located at the edge of the screen is the skip button. Thus, it cannot be considered as the bottom-up process. By repeated selection, users are already prepared to pay attention to the skip button, which implies that their goal also is already set due to repeated learning. Two respondents in this group paid intuitive attention to the skip button through the pop-out effect; however, the top-down process influenced most respondents' attention.

Regarding ad attention, neither the top-down nor the bottom-up process seemed to work in all three groups. No one in the three groups—despite a very small number of the samples—stated that they paid goal-oriented attention to the ad. For example, these participants did not have any intention to ultimately seek information or entertainment through ad attention and were not affected by any visually stimulating elements in the ad. According to the statements by two people from the running-time group and four from the control group who attended to the advertisement, the former felt boredom in waiting for 15 seconds and the latter, who did not know the running time of the ad, had nothing to do but watch the ad. Members of both groups did not have the motivation to consume the ad; thus, they did not pay active and/or voluntary attention to the ad but were reluctant to attend to it passively. In addition, no one mentioned visual inducement of the advertisement. The format of pre-roll advertising is already very friendly to online-video-website users (Nudd, 2014). Most of the participants in the current samples are very regular users of online video websites. According to the descriptive statistics, different samples in different groups used free-online-video websites more than 6 hours per week on average (6.64 hours for Group 1 / 7.20 for Group 2 / 7.62 for Group 3). The experimental stimulus of the current study followed the format of pre-roll advertising on YouTube.com, which more than 80% of the current samples pointed out as their favorite online video website. Therefore, the visual aspects of the experimental stimulus were not likely to be as fresh as to grab the samples' attention. The bottom-up process might not work.

Factors Affecting Ad Recall

Assuming different levels of attention between the skippable and unskippable pre-roll ad, the current study was interested in exploring the positive relationship between attention and ad recall (Goodrich, 2011; Intraub, 1979; Loftus & Kallman, 1979; Pieters et al., 2002). The exposure time, which would differ if the ad were skipped, was also a variable the current study considered as a factor affecting ad recall (Krugman et al., 1995; Patzer, 1991; Pieters & Bijmolt, 1997; Singh & Cole, 1993; Swallen, 2000). According to the current results, memory performance in the running-time group was the best, followed by the control group and the skip-button group. Theoretically, the significant difference between the running-time group and the control group was somewhat unexpected because both groups had the same exposure duration to the ad and did not show a significant difference of ad attention. No-significant difference between the control group and the skip-button group was also unforeseen because the control group showed higher ad attention and had more possibility of a longer exposure than the skip-button group, and thus would have been better in recalling the ad content.

The proper arousal level improves memory performance. The participants in the running-time group may have more increased levels of arousal than those in the control group. More specifically, the running-time bar with a yellow color is likely to give people proper tension that maintains a condition of arousal, either goal-oriented or just visually; on the other hand, there seems to be no element that plays such a role on the advertisement in the control group. Thus, the participants in the running-time group may show better memory performance than those in the control group. This assumption

can be supported by the Yerkes-Dodson Law (1908), which assumes that people's levels of arousal can affect their performance. The law describes that increased levels of arousal will improve performance, but only up until the arousal level reaches an optimum point. This traditional assumption was applied to a new, interactive technology setting. Jeong and Biocca (2012) found a linear and positive relationship between arousal and brand memory in video games. Returning to the current study, it is not certain if the optimum arousal level was reached in the current experiment, but the arousal level from the 15-second unskippable ad with the running-time bar may be more suitable to recall the ad content than an arousal level from the 15-second unskippable ad without any functions. The current study set up the 15-second exposure of the ad; however, when viewers are exposed to the unskippable ad for 30 seconds, another typical format of pre-roll advertising, their optimal level of arousal may instead drop. This can be a topic for future research. Following this logic, the participants in the skip-button group also are likely to include better memory performance than those in the control group. The skip function, which enables viewers to achieve their goal immediately, is more likely to increase the level of arousal and tension than the running-time bar, which is just seen passively. However, the recall score of the skip-button group was lower than the running-time group's, which implies that physical time of ad exposure (i.e., 5 vs 15 sec) would be a more influential factor on ad recall. Regarding no-significant differences between the skip-button group and the control group, it is hard to judge which factor, of the short exposure time and the rare arousal condition, would affect ad recall. In summary, two things can be considered from the current results. First, the unskippable pre-roll advertising showing its running time, which

maintains proper condition of arousal and guarantees exposure time of advertising, is more effective in aiding recall of ad content than is the skippable ad. Second, the attention level of skippable pre-roll advertising was lowest, and ad recall was also lowest on the skippable ad, which indicates that exposure time for 5 seconds is not enough to attend to an advertisement and recall the ad content.

Thankful for the Skip Function?

The current study revealed that the skip function of pre-roll advertising was not effective for both ad attention and ad recall. The skip button appeared on the ad was an obstacle to interrupt free-online-video users' ad attention. The exposure time shortened by skipping an ad restricted their ad recall. In addition, the current study investigated differences of viewers' perceptions toward skippable and unskippable pre-roll advertising. The basic assumption of the current study is that free-online-video users would show negative psychological responses to pre-roll advertising because of its forceful exposure. However, the skip function gives users the opportunity to avoid the forceful exposure of the ad; accordingly, it was expected that the skip function would alleviate the extent to which users perceive the ads as intrusive and irritating. The current study also hypothesized that free-online-video users would feel psychological reactance when they are intruded upon and irritated by the forced pre-roll ads and would perceive less threatened freedom to skippable pre-roll ads than to unskippable ones. Unlike the expectation, the participants in the skip-button group perceived more intrusiveness, irritation, and threatened freedom than those in the running-time group. Although they were given an opportunity to restore freedom threatened by the forced, intruded and irritating ad (i.e., skipping the ad after five seconds), they showed more

negative responses to the skippable ad rather than the unskippable ad. It seems that there are differences of psychological mechanism that free-online-video users feel between skippable and unskippable pre-roll advertising.

Negativity of the skip function. The current study suggests the following rationale behind the above result: (1) the linear relationship between attention and attitude and (2) goal-oriented tendency. First, the assumption that attention to an ad is positively associated with attitudes toward the ad is a traditional causal relationship between the two constructs (Lavidge & Steiner, 1961; Olney, Holbrook, & Batra, 1991; Thorson et al., 1992), even in the context of online advertising (Lee & Ahn, 2012). In this study, attention to the ad with the skip button was lower than with the running-time bar. Perceptions of intrusiveness, irritation, and threatened freedom are different from the concept of attitude, but these can underlie overall attitude toward advertising. Therefore, it seems theoretically valid that people have such negative responses to the skippable ad more than to the unskippable ad. Second, most participants in the current experiment paid goal-oriented attention to the skip button or the running time bar, according to their statements regarding the bottom-up and top-down process; however, the mean values of the attention level paid to each object showed a great difference (i.e., $M_{\text{Skip}} = 6.45$ vs. $M_{\text{Time}} = 3.59$). Although the levels of attention between different objects in different groups cannot be compared directly, the number of 6.45 in the 7-point scales is enough to reflect the participants' strong desire to skip the ad and to achieve their goal (watching video clips), in comparison with the extent of attention to the running time bar. In the structure of skippable advertising where goal achievement is very imminent (i.e., in just five seconds), users are more likely to turn into the goal-

directed mode than those who are defenseless against 15-second exposure. People in the goal-oriented mode tend to concentrate more on goal achievement and to feel more psychological reactance, such as unpleasantness and anxiety, about its delay than do those who are not (Apter, 1989). Moreover, the goal-oriented mode creates more tension and stress, followed by negative mood, than does the pleasure-oriented mode, which ultimately leads to positive mood (Thayer, 1996). Therefore, despite the functional option to avoid an ad, the delay of imminent goal achievement may emotionally make free-online-video users feel more intrusive, irritating, and threatened freedom toward the ad than does the fully forced exposure of the 15-second ad. The 5-second countdown of the skip button may work as the pressure of goal in sight that arouses viewers' tension and stress.

Why less negative toward the unskippable ad. On the other hand, why do free-online-video users show relatively less negative responses to unskippable advertising showing the running-time bar? Users affected by the top-down process are likely to have relatively more rational perceptions toward the ad than those in the bottom-up process. Knowledge formed by past experiences might alleviate negative perceptions toward the ad. More specifically, the format of pre-roll advertising is already very friendly to online-video-website users. Most of the current samples also are very regular users of online video websites. Moreover, the current experiment followed the format of pre-roll advertising used in YouTube, which was picked by most of the current samples as their favorite online video website. They have been already learned about the format of YouTube's fifteen-second unskippable pre-roll advertising. Probably, when they first encountered the forced ad that cannot be even skipped, they

might have strong psychological reactance like intrusiveness, irritation, and threatened freedom. However, through continuously repeated learning, users might understand the fifteen-second forceful exposure structurally and be obliged to admit it. Their emotional state about the unskippable forced ad is likely to become less and less negative than at the previous moment. Users affected by the top-down factor like past experience may have emotional inertia toward the unskippable ad. Kuppens, Allen, and Sheeber (2010) defined the concept of emotional inertia as “the degree to which a person’s current emotional state can be predicted by the person’s emotional state at a previous moment (with high predictability reflecting high inertia)” (p. 985). More specifically, learned emotional experiences are likely to make people have immunity to emotional consumption in the same or similar scenes or moments, which is called high emotional inertia. The people’s emotional state may be relatively more impervious to either psychological or environmental stimuli than in the condition of low emotional inertia, where people tend to be susceptible to, responsive to, and influenced by internal and external changes (Kuppens et al., 2010). Of course, emotional inertia can also occur against the skippable ad, but viewers may be too active—clicking the skip button in five seconds every time—to have emotional inertia in such the technical structure of the skippable ad.

Negativity of uncertainty. As discussed earlier, free-online-streaming-video users are more likely to feel intrusive, irritating, and threatened freedom to the skippable ad than to the unskippable ad with the running-time bar. However, although it was also an unskippable ad, why was the control stimulus more negative than the unskippable ad showing the running time and not significantly different from the skippable ad? Facing

the control stimulus, free-online-video users might experience *uncertainty*, which individuals seek to reduce for cognitive consonance (Festinger, 1962). More specifically, when users who already had prior knowledge about the typical formats of pre-roll commercials were confronted with a pre-roll ad without both the skip button and the running-time bar, they would not only be able to skip the ad but would be also uncertain about how long the ad was going to be. Thus, they might feel discomfort about the pre-roll ad contradictory to what they had known and been used to. Internal psychological inconsistency would lead users to have more negative perceptions toward the ad. Users might feel psychological resignation from unskippable ads, either with the running-time bar or without it (i.e., reluctant acceptance of the unavoidable ad); however, the uncertainty of ‘how longer’ is likely to make the difference of users’ psychological reactance between those two stimuli.

Practical Implications

Indeed, it may be difficult to expect users would not skip the ad. A pre-roll ad that could have been skipped but was not may represent a successful impression, because this behavior reflects some level of interest in the brand or product. Therefore, advertising practitioners, including advertisers and agencies, should think about how to make users pay more attention to ad content in the five seconds before the ad is skipped. The ad, whether entertaining or informative, should be able to give viewers a strong impression of brand image or product information in the first five seconds.

Users do not want to wait for the full length of 15- or 30-second ads. Even though they would prefer not to watch the ads, due to the total time of exposure, it may seem inevitable that the degree of attention to the unskippable ad should be higher than

that of the skippable ad. Indeed, our samples did pay more attention to unskippable ads (i.e., the ad showing the running time and the controlled ad) than to skippable ads. However, advertising practitioners need to consider a possibility that attention inertia may occur for free online video users. According to Anderson, Choi, and Lorch (1987), when an individual's attention continues to be paid to an object, the amount of attention he/she invests in the object will decrease over time. For example, in the beginning a free video user would be more likely attracted to a pre-roll ad, but when the user's mental process has operated for a period of time, his/her mental process would be less susceptible to interruptions by the ad. For repeated users, the pre-roll ad may be not only a physical distractor but a psychological indifferent object.

Similar to five-second persuasion in skippable pre-roll ads, unskippable ads also need to concentrate on the beginning part of the messages before attention inertia occurs. According to a report by the Wall Street Journal, many advertisers simply adapt or recycle their existing 30-second TV commercials (Marshall, 2014). Those commercials are designed specifically for use on TV, but are less optimized to use as a pre-roll ad on the web. Advertising practitioners need to avoid repeated exposure to the same content and think about developing a variety of ad content suited to the pre-roll format and specifically for online viewing.

CHAPTER 3

Study 2: Modified Two-Route Hierarchy of Effects Model

While Study 1 focuses on the comparison between two different formats of pre-roll advertising, the skippable and non-skippable ad, in terms of attention, recall, other psychological responses (i.e., perceived threatened freedom, perceived intrusiveness, and perceived irritation), Study 2 centers on the effect of dispersed attention on attitudes within each format of pre-roll advertising, thus modeling the process of psychological reactance.

Impact of Dispersed Attention on Attitude and Recall

The causal sequence of attention and attitude has been a traditional linear relationship that explains advertising effectiveness, or how advertising works (Lewis, 1898; as cited in Thorson et al., 1992). The hierarchy of effects model, one of the earliest theories, assumes that people attend to a commercial, learn and remember its content, develop attitudes, and generate conative responses. Other advertising hierarchy studies have consistently reported the positive association between attention and attitude (Lavidge & Steiner, 1961; Olney et al., 1991; Thorson et al., 1992). Even in the online environment, a recent study on banner ad effectiveness (Lee & Ahn, 2012) also found that consumers with more frequent attention had more favorable attitudes toward a brand. Therefore, attitude is an effective tool to measure advertising effectiveness (Haley & Baldinger, 1991; Mitchell, 1993; Thorson et al., 1992).

Reviewing the Hierarchy of Effects Model

The hierarchy of effects model has been widely used and modified by academic researchers and marketing practitioners to assess the effectiveness of advertising (Barry

& Howard, 1990; Weilbacher, 2001). For advertisers who try to grab consumers' attention, involve them in ads, and create positive perceptions in their minds, this model has been used as an appropriate tool of marketing communication strategy (Rehman, Javed, Nawaz, Ahmed, & Hyder, 2014). The traditional hierarchy framework suggests that consumers respond to messages in three different but ordered ways, from cognition, to affectiveness, to conation (Rehman et al., 2014; Wijaya, 2012). Cognition refers to creating positive impacts on consumers' minds, beliefs, and knowledge. Affective messages elicit consumers' feelings and product likeability (e.g., attitude). Conation refers to consumers' behavioral intentions or actual behaviors (e.g., purchase). Bovee, John, George, and Marian (1995) argue that the hierarchy model basically assumes that consumers first learn something from advertising, then form feelings about the product in question, and finally take action, following the traditional hierarchy framework of cognition, affect, and conation. Jarmo, Jaana, Liisa, and Anssi (2010) presume that attention is required as a first step and works as an antecedent for further information processing. Rehman et al. (2014) state the "Hierarchy of effects model is used to minimize the psychological hesitation in customer's attitude toward advertisements" (p. 301). By reviewing various hierarchy of effects models that have been developed over time by researchers, the model of the current study establishes its theoretical validity.

According to Rehman et al. (2014), Lewis introduced the three stages of the hierarchy of effects for the first time in 1898, as a guide for salesmen to be successful: attention, interest, and desire (AID). Later, Lewis added the action stage as necessary to convince salesmen to move consumer prospects through the selling process completely (AIDA). Explaining the effectiveness of advertising, Macey (1900) supported Lewis'

argument: “The advertisement must receive attention, having attention it must create interest, having the readers’ interest it must create desire to buy; having created the desire to buy it should help decision” (as cited in Rehman et al., 2014, p. 302). In 1910, a Printers’ Ink editorial also mentioned the hierarchy model as a tool for successful advertisement production and suggested the stage of *conviction* instead of desire (AICA). Later, according to Barry (1987), many researchers continued to modify the existing model to enhance the effectiveness of advertising.

For example, Sheldon (1911; as cited in Barry, 1987) argued that one important element of the purchase process, the result of purchase, was missing from the AIDA model, and added a final step called *satisfaction*, to form AIDAS. Modifying AICA, Hall (1915; as cited in Barry, 1987) argued that the stage of *confidence* was another necessary consideration in writing better advertisements, and should be placed before conviction (AICCA). In 1920, West Coast Life Insurance Company adopted a modified model to make its advertisements more effective, presenting a five-step model: attracting attention, creating desire, removing inhibitions, inspiring confidence, and compelling to action (ADICA). What is notable from the ADICA model is the first appearance of a negative element, *inhibition*, in the hierarchy of effects model. This indicates that when researchers create a hierarchy model to predict the effectiveness of advertising, consideration should be given to not only positive components aiding the enhancement of effectiveness but also negative factors that interrupt it and should be strategically removed in the marketing process (Barry, 1987).

Further reviewing earlier models, while writing a book on how to create effective direct advertising, Ramsay (1921; as cited in Barry, 1987) suggested that the

stage of *caution* was needed between desire and action in the AIDA model, which was called AIDCA. Kitson (1921; as cited in Barry, 1987)) emphasized the role of *conviction* instead of caution, like in the AICA and AICCA models. He used this model to study how the mind of the consumer works. Giving consideration to the persuasive, creative processes in advertising, Osborn (1922; as cited in Barry, 1987) used the term *judgment* in the hierarchy model for the first time, which might refer to the comprehensive meaning of the affective stage, including desire, conviction, confidence, caution, and inhibition.

Strong (1925; as cited in Rehman et al., 2014) tried to establish Lewis' framework theoretically. He identified a series of mental steps that occurred when consumers were involved in the purchase process: want, solution, purchase, and satisfaction. Then, he modified his model in which the process should be: want, commodity, trade name, purchase, and satisfaction or dissatisfaction; the last was soon eliminated from the model based on the idea that the purchase process should be pleasant. Finally, he concluded that the purchase process begins with rising wants and ends with the action of purchase. He elaborated the process as a theory to explicate consumers' purchasing psychology and behavior: attention, interest, desire, and action (AIDA), which has been one of the most referenced hierarchy models in both advertising and marketing literature.

However, as several earlier researchers had pointed out in Lewis' framework, Bedell (1940; as cited in Rehman et al., 2014) also criticized Strong's (1925) conclusion and emphasized the necessity of the *conviction* stage after the stage of desire, following Kitson's (1921) AIDCA model: attention, interest, desire, conviction, and action. Lucas

and Britt (1950; as cited in Rehman et al., 2014) also, in their book Advertising Psychology and Research, accepted the AIDCA model as an advertising formula. On the other hand, Devoe (1956; as cited in Rehman et al., 2014) argued that these models were not distinguishing ‘attention to the product’ from ‘attention to the advertisement’ and suggested two different psychological sequences: AIDCA (attention, interest, desire, conviction, and action) and AIDMA (attention, interest, desire, memory, and action). AIDMA as a model is meaningful in that it presented the role of *memory* as a variable that predicts the effectiveness of advertising. Therefore, Devoe’s approach can be used as theoretical evidence in establishing the current study’s model.

Following Devoe (1956) in 1961, Lavidge and Steiner initiated a turning point in the historical development of the hierarchy of effects model by reflecting human psychology in the framework (Barry, 1987). Rehman et al. (2014) classifies models before Lavidge and Steiner as the early development phase and ones since then as the modern development phase. In consideration of consumers’ consumption tendencies, Lavidge and Steiner (1961) argued that advertising should be considered an investment in a long-term process that leads consumers from awareness to the action stage over time, and thus the AIDA model was not enough to explain the whole process. They suggested a series of seven more specific steps that consumers should pass through to the threshold of purchase: unawareness, awareness, knowledge, liking, preference, conviction, and purchase. However, it was soon realized that (1) each stage is not equally important, (2) these stages do not always occur hierarchically (i.e., sometimes consumers take several steps simultaneously), and (3) the possibility of negative

attitudes should be considered. Accordingly, some of the steps were eliminated and the model was simplified to only three steps: cognition, affect, and conation (Barry, 1987).

Colley (1961) argued the goal of advertising should be more specifically defined to measure the effectiveness of advertising more precisely. In other words, advertising goals are not only to elicit consumers' purchase action, but can also be the degree in which advertising raises consumer awareness on its message, the degree in which consumers understand the core message, and the degree in which consumers are convinced of the message. His model consists of four steps, awareness, comprehension, conviction, and action, and is known as DAGMAR, which stands for Defining Advertising Goals for Measured Advertising Results. This means each stage can be the goal of advertising and the measurement of advertising effectiveness can vary according to the goal.

In the same year (1961), the Advertising Research Foundation suggested a five-step model be used for developing more effective advertising campaigns: (1) the exposure of advertising occurs; (2) consumers begin to perceive the ad; (3) they obtain knowledge about ad content; (4) they form attitudes toward the ad; and (5) they finally act (Barry, 1987). The foundation considered the series of steps, including knowledge acquirement and attitude formation, as the process of communication between consumers and brands. Highlighting the importance of communication, thus, the model consisted of exposure, perception, communication (knowledge), communication (attitude), and action (EPCCA). The variable of *exposure* was used as the first step of the hierarchy instead of attention or awareness. Then, linking from perception to knowledge, the cognitive process was more emphasized. Also, the function of attitude

as an antecedent of action was initially mentioned in the hierarchy of effects model. The model presenting the role of attitude as a predictor in measuring advertising effectiveness is significant to the field (Barry, 1987).

Focusing on consumers' acceptance of advertising, Wolfe, Brown, and Thompson (1962; as cited in Barry, 1987) established guidelines for more aggressive ad strategy. A five-step hierarchy model was suggested: awareness, acceptance, preference, intention, and provocation of sale (AAPIS). The variable of *intention* was first used as an antecedent of action (i.e., sale) in the model of hierarchy types. The assumption that behavior is determined by behavioral intention has been verified in several behavioral theories such as the theory of reasoned action (Fishbein & Ajzen, 1975), the theory of planned behavior (Ajzen, 1991), and the technology acceptance model (Davis, 1989).

Rogers (1962; as cited in Rehman et al., 2014) applied hierarchy concepts to the process of new product adoption. He argued that consumers go through five stages to adoption: awareness, interest, evaluation, trial, and adoption (AIETA). Later, Robertson (1971; as cited in Rehman et al., 2014) developed the expanded adoption model with six steps: awareness, comprehension, attitude, legitimation, trial, and adoption (ACALTA). The stages of interest and evaluation were modified with comprehension, attitude, and legitimation. This model was based on Howard and Sheth's (1969; as cited in Barry, 1987) theory of buyer behavior following the steps: attention, comprehension, attitude, intention, and purchase (ACAIP). This implies that attitude is a significant predictive variable that leads to consumer behavior, even in the process of new product adoption.

Simplifying Wolfe et al.'s (1962) acceptance model, Aspinwall (1964; as cited in Rehman et al., 2014) suggested the consumer acceptance hierarchy, which assumes

three steps: acceptance, preference, and insistence (API). Sandage and Fryburger (1967; as cited in Rehman et al., 2014) presented a model that consisted of four steps: exposure, perception, integration, and action (EPIA). Schwartz (1969; as cited in Barry, 1987) measured the effectiveness of company ads with the five-step model: exposure, attention, retention, attitude change, and purchase (EARACP).

Considering consumers as information processors, McGuire (1969) proposed the information processing model with six stages. When information (i.e., ad message) is presented, consumers attend to, comprehend, yield to, retain the information, and then behavior occurs (PACYRB). Moreover, he argued the occurrence of each stage in the hierarchy could be associated with probabilities. Specifically, the probability in which the subsequent stage occurs depends upon the occurrence of the previous sequence. His view corresponds to Colley's (1961) argument in DAGMAR that each stage can be the goal of advertising.

In the 1970s, several new hierarchy models were presented and existing models were modified. Based on McGuire's (1969) model, Longman (1971; as cited in Rehman et al., 2014) suggested that the process consisted of forming beliefs, being motivated as a result of those beliefs, and acting according to motivation, instead of yielding and retention. He modeled the seven-step hierarchy, which follows more cognition-oriented propositions as: exposure, attention, perception, comprehension, belief, motivation, and action (EAPCBMA). Devoe (1956) first noted the role of memory in measuring advertising effectiveness, and Holbrook (1975) brought that proposition back into his own model two decades later. Focusing on the positive association from memory to attitude, he suggested a model that consisted of attention, perception, memory, attitude,

and intention (APMAI). Anderson and Barry (1979) were the first to add the construct of brand loyalty to the hierarchy of effects model.

The focus of hierarchy model research in the 1980s was on expansions to the traditional model. Preston's (1982) association model highlighted more comprehensive consumer information processing. He argued that in order for the model to be more valid, it should include more specific steps about how consumers process information to go through action. Accordingly, he suggested the following steps: distribution, vehicle exposure, ad exposure, ad awareness, ad elements awareness, association evaluation, product perception, integrated perception, product evaluation, prior evaluation, integrated evaluation, product stimulation, prior stimulation, integrated stimulation, and action. Preston and Thorson (1984) added three different action steps after integrated stimulation to the association model of 1982: search, search perception, search evaluation, search stimulation, trial, trial perception, trial stimulation, adoption, adoption perception, adoption evaluation, and adoption stimulation.

By reviewing a variety of traditional and modified hierarchy models, the current study tries to give theoretical validity to its current model.

Validity of the Current Model

In summary, the basic framework of most hierarchy models is likely to follow the steps of cognition, affect, and conation. Several well-known hierarchy models, such as AIDA, Lavidge and Steiner's (1961), and Colley's (1961) model, follow the traditional learning process, which is called the think-feel-do model. The traditional steps may vary according to the degree of the consumer's individual involvement or product involvement (Petty & Caccioppo, 1986), for example, feel-think-do, do-think-

feel, and do-feel-think (Richard & Vaughn, 1980). Nonetheless, Dragon (2011) argued that AIDA is the oldest but still most representative model to explain the effectiveness of advertising and marketing communications. A century since the first appearance of AIDA in marketing, Rossiter and Percy (1998) still believed that consumers would pass through traditional learning processes regarding the brand effectiveness: category need, brand awareness, brand attitude, brand purchase intention, and purchase facilitation. With respect to the stage of awareness, which had been suggested in the development of DAGMAR in 1961, it has been regarded as combination of the phases of attention and interest in AIDA (Wijaya, 2012). According to Smith, Chen, and Yang (2008), although many different stages and sequences of hierarchy models have been developed and modified, most models always have formed a sequence of attention, attitude and in the end action or purchase. Supporting the AIDA model as the most persuasive hierarchy model, Smith et al. (2008) considered the phase of attention as a representative stage of cognitive responses, viewed the phase of attitude as an inclusive stage of affective responses (such as liking, preference, and desire), and defined the action of purchase as conation. The positive and hierarchical association between attention and attitude presented in most reviewed models is applied to the current model for the context of pre-roll advertising.

Recently, the AIDA model was applied and reformulated in the context of the digital marketing. Based on the steps of AIDA, Wijaya (2012) suggested AISDALSLove as follows: attention, interest, search (the interesting product or brand), desire, action, like or dislike (the experienced product or brand), share (the experiences), and love or hate (as the long-term effect). In the context of advergaming (i.e., an

integration of advertising and online game), Ghirvu (2013) tested the AIDA model to examine whether promotions in the advergame would create consumer awareness and interest, whether pleasure from playing the game would lead to consumer purchasing desire, and whether sharing the game experience would generate actual purchases. In order to investigate the effectiveness of pre-roll advertising, one of the representative digital ad formats, the current study focuses on the effect of attention to the pre-roll ad on attitudes toward it. As assumed in most hierarchy of effects models reviewed earlier, the positive relationship between attention and attitude functions as a basic framework of the current model.

Dispersed Attention

However, viewers' attention to pre-roll ads may be dispersed due to the competitive situation of visual attention between ad content and the skip button or ad content and the running time of the ad. If viewers are more attentive to the ad itself, the link between attention and attitudinal responses would be positively strong, as hypothesized in the traditional hierarchy models. But, if viewers' attention were dispersed by other competitive visual objects, such as the skip button and the running time display, the positive formation of attitude would be interfered with. According to McGuire's learning theory (1966), distraction presented during persuasive communication should interfere with the learning of a new attitude – the persuasive argument – thus lessening attitude change. Gardner (1966) reported that divided attention interfered with reception and understanding of a persuasive marketing message. Teixeira, Wedel, and Pieters (2010) argued that whether or not commercials retain consumers successfully depends on the extent that commercials can focus

consumers' attention. The researchers found in the eye-tracking experiment that the degree of attention dispersion was positively associated with the likelihood of ad avoidance. In the case of the pre-roll ad context, viewers' attention to the skip button or the running time of the ad may reflect a tendency or intention to avoid an ad, which is affected by attitudes toward the ad (El-Adly, 2010). Therefore, the following hypotheses are postulated:

When free-online-video viewers encounter a pre-roll ad without the skip button:

H6a. Attention to the ad content is positively associated with viewers' attitudes toward the ad.

H6b. Attention to the running time of the ad is negatively associated with viewers' attitudes toward the ad.

When free-online-video viewers encounter a pre-roll ad with the skip button:

H6c. Attention to the ad content is positively associated with viewers' attitudes toward the ad.

H6d. Attention to the skip button is negatively associated with viewers' attitudes toward the ad.

The Association from Attention to Recall

With respect to the relationship between attention and recall, as discussed in Study 1, there is a traditional positive linear relationship in that the more attention audiences pay to ad content, the more amount of recall they have (Goodrich, 2011; Intraub, 1979; Kirmani, 1997; Lee & Ahn, 2012; Loftus & Kallman, 1979; Pieters et al., 2002; Yaveroglu & Donthu, 2008). As reviewed earlier, Devoe's (1956) hierarchy model distinguished 'attention to the product' from 'attention to the advertisement,'

which emphasized memory of the advertisement. For the current study that focuses more on attention to the pre-roll ad itself rather than on attention to the product in the ad, the role of recall is considered as an important variable to predict ad effectiveness. However, although the basic hierarchy model of advertising effects assumes that ad attention would drive ad learning or memory, which would in turn affect attitude toward the ad and its brand, and finally, conative responses to the ad, several hierarchy of effects studies have been skeptical about the mediating role of memory (Gibson, 1983; Leavitt, 1970; McGuire, 1969; Thorson et al. 1992).

Specifically, focusing on the hierarchical characteristics of responses to commercials, Leavitt (1970) measured participants watching commercials with 52 adjectives, in common, which were extracted from various consumer focus groups. The following four dimensions were found from factor analysis of the adjectives: stimulation (e.g., amusing, energetic, novel, slow, and worn out), relevance (e.g., convincing, credible, realistic, irritating, and confusing), gratification (e.g., agreeable, attractive, tender, and warm), and familiarity (e.g., well-known, new, and saw before). In validation attempts of the study of whether the four dimensions would reflect the four stages of the basic hierarchy model (i.e., attention, learning or memory, attitude change, and conative impact), Leavitt found relationship between stimulation and attention and the link between relevance and attitude/conation. However, none of the four dimensions was associated with memory. Based on this study, Thorson et al. (1992) suggests the two-route hierarchy of effects model, which indicates that memory is not correlated with attitude: (1) the comprehension/learning route, in which attention determines comprehension and memory, and (2) the evaluative route, in which attention determines

attitude. In other words, memory and attitude are each an independent variable to predict advertising effectiveness, rather than being in the mediating relationships.

Adopting Thorson et al.'s (1992) model, the current study anticipates a positively strong link between attention and recall; however, as mentioned earlier, in the situation of separated attention, the following hypotheses are advanced:

When free-online-video viewers encounter a pre-roll ad without the skip button:

H7a. Attention to the ad content is positively associated with viewers' ad recall.

H7b. Attention to the running time of the ad is negatively associated with viewers' ad recall.

When free-online-video viewers encounter a pre-roll ad with skip button:

H7c. Attention to the ad content is positively associated with viewers' ad recall.

H7d. Attention to the skip button on the ad is negatively associated with viewers' ad recall.

Negative Psychological Factors Affecting Attitude

On the nature of forceful exposure to pre-roll advertising, the current model presents the hierarchy of audiences' psychological responses occurring after attention. The current study focuses on a linear relationship among three different psychological factors that can have an influence on negative attitudes toward pre-roll advertising: perceived intrusiveness, perceived irritation, and perceived threatened freedom. Lavidge and Steiner (1961), in their traditional hierarchy model, already highlighted the importance of reducing negative psychological factors as well as enhancing positive ones to form consumers' positive attitudes toward advertising. Previous studies on ad avoidance have considered these constructs as antitheses of ad avoidance (Cho & Cheon,

2004; Edward et al., 2002; Li et al., 2002). In the context of the current study, the situation of attention to the ad content should be distinguished from the situation of attention to the skip button or the running time of the ad. That is, more attention to the ad than to the skip button or to the running time of the ad may reflect that viewers do not feel as much intrusiveness as they are not attempting to avoid the ad. On the other hand, more attending to the skip button or the running time of the ad may imply that viewers feel ad intrusiveness and irritation, because of a sense that their behavioral freedoms are threatened, resulting in their attempt to restore the threatened freedom through ad avoidance. Based on the assumptions of Brehm's (1966) psychological reactance theory and the process of ad avoidance, the current model proposes hierarchical associations from attention and other psychological responses to attitudes toward the ad. More specific explications of the hypothesized paths are as follows.

From Attention, Perceived Intrusiveness to Irritation

Advertising tends to ultimately be considered as irritating and to be avoided due to content, execution, or placement; therefore, it will initially be assessed according to the degree to which it interrupts audiences' goals, perceived intrusiveness (Li et al., 2002). Intrusiveness is defined as "a perception or psychological consequence that occurs when an audience's cognitive processes are interrupted" (Li et al., 2002, p. 39). Thus, commercials within media content are not themselves intrusive, but rather regarded as intrusive, and the commercials should be perceived as interrupting audiences' goals. Even though intrusiveness is usually thought of as a cognitive process in which audiences might recognize advertising as interruptive, it seems distinct from negative emotions and reactions. Li et al. (2002), who developed the scale of the

construct *perceived intrusiveness*, depicts the inherent nature of intrusiveness by noting: “Intrusiveness describes the mechanism by which ads evoke negative emotional reactions, such as irritation or annoyance, but not the negative emotional reactions themselves” (p. 39). For instance, although an advertisement intrudes into the media content, if the content user does not feel intruded upon by the placement of the ad, the ad would not be intrusive. That is, situational intrusiveness is differentiated from emotional intrusiveness. However, if the user perceives it as intrusive, a negative emotional reaction, irritation, is likely to occur as a result (Edwards et al., 2002; Li et al., 2002). This is why perceived irritation should be considered as an outcome measure of perceived intrusiveness, and the current model pays attention to the mediating relationships of these two constructs.

In the context of pre-roll advertising, both skippable and unskippable pre-roll ads intrude before main content videos and hinder the viewers’ goal (i.e., watching a video). In other words, more attention to the running time of the ad or skip button may indicate that viewers feel more intrusiveness against the goal pursuit. Moreover, the methods of ad execution and of ad placement are likely to irritate viewers. Therefore, the following hypotheses are posited:

When free-online-video viewers encounter a pre-roll ad without the skip button:

H8a. Attention to the ad content is negatively associated with a level of perceived intrusiveness.

H8b. Attention to the running time of the ad is positively associated with a level of perceived intrusiveness.

When free-online-video viewers encounter a pre-roll ad with the skip button:

H8c. Attention to the ad content is negatively associated with a level of perceived intrusiveness.

H8d. Attention to the skip button is positively associated with a level of perceived intrusiveness.

When free-online-video viewers encounter a pre-roll ad without the skip button:

H9a. A level of perceived intrusiveness is positively associated with a level of perceived irritation.

When free-online-video viewers encounter a pre-roll ad with the skip button:

H9b. A level of perceived intrusiveness is positively associated with a level of perceived irritation.

From Perceived Irritation to Threatened Freedom

The path from perceived intrusiveness and irritation to threatened freedom should be explained by a step-by-step psychological mechanism. The basic assumption of Brehm's (1966) psychological reactance theory is that threat to or forceful restriction of an individual's behavioral freedom evokes psychological reactance. Knowing this assumption, a technical starting point for perceiving the threat to behavioral freedom would be the moment when an advertisement physically intrudes into the media content and the user begins to recognize intrusiveness. However, as aforementioned, the physical intrusiveness itself would not be an element to threaten the user's freedom. When the user perceives irritation by that intrusiveness, the advertisement would be a factor threatening her/his behavioral freedom (e.g., disturbing the main goal of media use).

In the context of the current study, pre-roll advertising is operationally designed

to intrude before the execution of free online videos. Moreover, if the users feel that situational or physical intrusiveness is irritating because they are delayed in achieving the goal (i.e., watching videos) and their behaviors are forcefully restricted by the ad, they would perceive a freedom as threatened, based on the assumption of psychological reactance theory (Brehm, 1966). Although skippable pre-roll advertising is more likely to be relatively less threatening to behavioral freedom, due to its option to skip the ad, than the unskippable one, all users of both formats would have perceptions of threatened freedom toward the forceful and irritating intrusiveness. The term *irritating intrusiveness* defines the causal relationship from perceived intrusiveness to irritation. Thus, the following hypotheses are posited:

When free-online-video viewers encounter a pre-roll ad without the skip button:

H10a. A level of perceived irritation is positively associated with a level of perceived threatened freedom.

When free-online-video viewers encounter a pre-roll ad with the skip button:

H10b. A level of perceived irritation is positively associated with a level of perceived threatened freedom.

From Perceived Threatened Freedom to Attitude

Psychological reactance theory explains individuals' psychological conflict that may occur during contradictory communication between persuasion and coercion (Brehm & Brehm, 1981). In other words, the degree to which these persuasive but coercive attempts intrude on an individual's freedom determines the individual's response, which Brehm (1966) terms reactance. This concept is referred to as a boomerang effect; when audiences perceive coercion from persuasive communication,

they tend to adopt an opposite position or form an attitude against the persuasion in order to restore freedom lost to coercion (Sensenig & Brehm, 1968).

More specifically, Clee and Wicklund (1980) found hard-sell strategies were less effective than soft-sell strategies. Brehm and Brehm (1981) reported that hard-sell communication better revealed the advertiser's intent and thus led to greater consumer resistance. Robertson and Rossiter's (1974) study showed the strong correlation between perceptions of persuasion and less favorable attitudes toward the product. These coercive persuasion attempts not only restrict consumers' freedom of choice, but also lead to a stronger desire to restore threatened freedom (Brehm, 1966; Brehm & Brehm, 1981; Clee & Wicklund, 1980). Correspondingly, consumers' counterarguments and negative emotions would be formed against the ad claim.

The concept of coercion defined in the current study refers not to the message of the ad but to the technical means of ad display. Bauer and Greyser (1968) classify causes of ad annoyance or irritation into three categories, including ad content, ad execution, and ad placement. With the nature of pre-roll advertising in the online video format, both ad execution and ad placement can be factors that irritate users and threaten their freedom. That is, when free-online-video users are coercively exposed to full-screened video ads with the same size as the main media content, they would feel irritating intrusiveness, which in turn threatens their behavioral freedom to watch video clips without interruption, ultimately forming negative attitudes as a result of their psychological reactance. Therefore, the following hypotheses are postulated:

When free-online-video viewers encounter a pre-roll ad without the skip button:

H11a. A level of perceived threatened freedom is negatively associated with

viewers' attitudes toward the unskippable pre-roll ad.

When free-online-video viewers encounter a pre-roll ad with the skip button:

H11b. A level of perceived threatened freedom is negatively associated with viewers' attitudes toward the skippable pre-roll ad.

The Mediating Role of Perceived Social Exchange

Pre-roll advertising is one of the core profit-making structures for free-online-video websites (Nudd, 2014). The idea that watching ads may be a type of reciprocity, whereby users pay back websites for providing free videos, is supported by the social exchange theory (Cropanzano & Mitchell, 2005; Emerson, 1976; Tanskanen, 2015). Of course, the current study does not assume that users would actively accept an ad because they perceive an obligation of reciprocity toward the ad itself. The assumption of this study focuses on that users' understanding of the structural association between the must-see ad and free service would result in building the reciprocal—very functional—relationship between consumers of free service and its supplier (e.g., YouTube.com and its users), which ultimately leads to the enduring social exchange between the two parties. The current study expects that such a perception of social exchange may alleviate unfavorable attitude toward the forced ad. More details of the concepts of reciprocity and social exchange are as follows.

The Concept of Reciprocity

Reciprocity, a key concept explaining the durability and stability of exchange relationships (Larson, 1992), is regarded as a useful theoretical framework in relationship research (De Wulf, Odekerken-Schroder, & Iacobucci, 2001; Huppertz, Arenson, & Evans, 1978; Palmatier, Jarvis, Bechkoff, & Kardes, 2009). The principle of

reciprocity holds that people feel psychological obligations to return what they receive from others (Bagozzi, 1995; Gouldner, 1960), as well as psychological guilt whenever they violate the reciprocal norm (Li & Dant, 1997). The concept of reciprocity has been used in a number of studies to understand the psychological processes involved in building relationships between customers and companies (Bagozzi 1995; De Wulf et al., 2001; Kang & Ridgeway, 1996). Bagozzi (1995) argued that a consumer displays loyalty to a company in reciprocation of its investment in the relationship. Kang and Ridgeway (1996) argued that a company's friendliness evokes the payback obligation toward the company from consumers. Additionally, De Wulf et al.'s (2001) model of customer relationship building showed statistically significant links between relationship marketing tactics, perceived relationship investment, relationship quality, and behavioral loyalty.

Moon (2000) has questioned whether the principle of reciprocity is compatible with the realities of consumer research, because a reciprocal interaction between a consumer and a company would require a one-to-one interaction with every consumer. However, the current study considers the relationship between the website and its users in the context of the online environment. Unlike in the traditional offline environment, a one-to-one interaction between the two parties is available in the online environment.

Understanding Social Exchange Theory

According to Emerson (1976), the basic assumption of social exchange theory is that individuals act to reduce costs and maximize rewards. Thus, to maximize benefits, individuals tend to take on costs only if those costs do not outweigh the expected rewards. The focus of the theory is on the persistent relationship between two parties

who engage in the recurring exchange. The parties or subjects of relationship originally refer to between individuals, between corporate groups or between individuals and corporate groups (Tanskanen, 2015), but are expanded to even between consumers and brands in the marketing perspective (Palmatier et al., 2009). Molm (1997) argued that the exchange processes are based on the mechanism of behavioral psychology and the principle of economics but should be understood within social structure as the framework. The choice of exchange is determined more by past experiences than by the characteristics of subjects. That is, involvers of the exchange learn from prior experiences, and attempt to maximize positive aspects and minimize negative ones, based on those experiences (Homans, 1961).

The social exchange theory follows the norm of reciprocity, which refers to responding to a positive action with another positive action and being rewarded for each other (Homans, 1961). Subjects tend to behave in ways that facilitate desired outcomes; thus, the theory is commonly called as a ‘rational choice’ theory (Molm, 1997).

Different from the case of negotiated exchange in which subjects go through a joint decision-making process, subjects in the reciprocal exchange engage in an independent decision-making process and are not negotiated (Molm, 1997). The reason that exchanges are enabled without conscious calculations is because of the assumption that social interactions basically contain value that can be exchanged (Tanskanen, 2015).

Applying to the context of the current study

The two parties of social exchange in this study’s context are a free-online-video website (e.g., YouTube.com) and its users. The website’s content is provided for free and users are required to be exposed to commercials, which comprise a large portion of

the website's profit. When users encounter the forced ads, they tend to have negative perceptions first, such as intrusiveness, irritation, and threatened freedom, which lead to unfavorable attitudes toward the ads, rather than an attempt to understand why they must be forcefully exposed to the ads. However, they seem to be willing or reluctant to accept pre-roll ads (costs) to enjoy free video clips (rewards). While free service is value for users, advertising earning is value for the website. The interaction between the two parties contains value that can be exchanged. The enduring relationship is built through the recurring interaction. Despite negative aspects such as discomfort of media use from users' perspective and such as no-content-earning from the website's perspective, the two subjects may be reciprocal by taking positive actions for each other (i.e., offering free service and investing a little time in watching an ad).

In summary, the industry estimation that the portion of the ads skipped would reach about 90 percent (Elkin, 2016) may imply that free-online-video users still perceive pre-roll ads as interruptive objects to avoid rather than as a type of reciprocity. Nonetheless, if they perceived the structured system of the socioeconomic exchange with the website, users might be relatively generous with the intruded ads. It is expected that a perception of social exchange would play a mediating role between perceived threatened freedom and attitudes toward the pre-roll ad. Therefore, the following hypotheses are postulated:

When free-online-video viewers encounter a pre-roll ad without the skip button:

H12a-b. A level of perceived threatened freedom is negatively associated with a level of perceived social exchange (H12a), which positively affects attitudes toward the unskippable pre-roll ad (H12b).

When free online video viewers encounter a pre-roll ad with the skip button:

H12c-d. A level of perceived threatened freedom is negatively associated with a level of perceived social exchange (H12c), which positively affects attitudes toward the skippable pre-roll ad (H12d).

All the hypotheses are summarized in Figure 4-1 (unskippable ad model) and Figure 4-2 (skippable ad model).

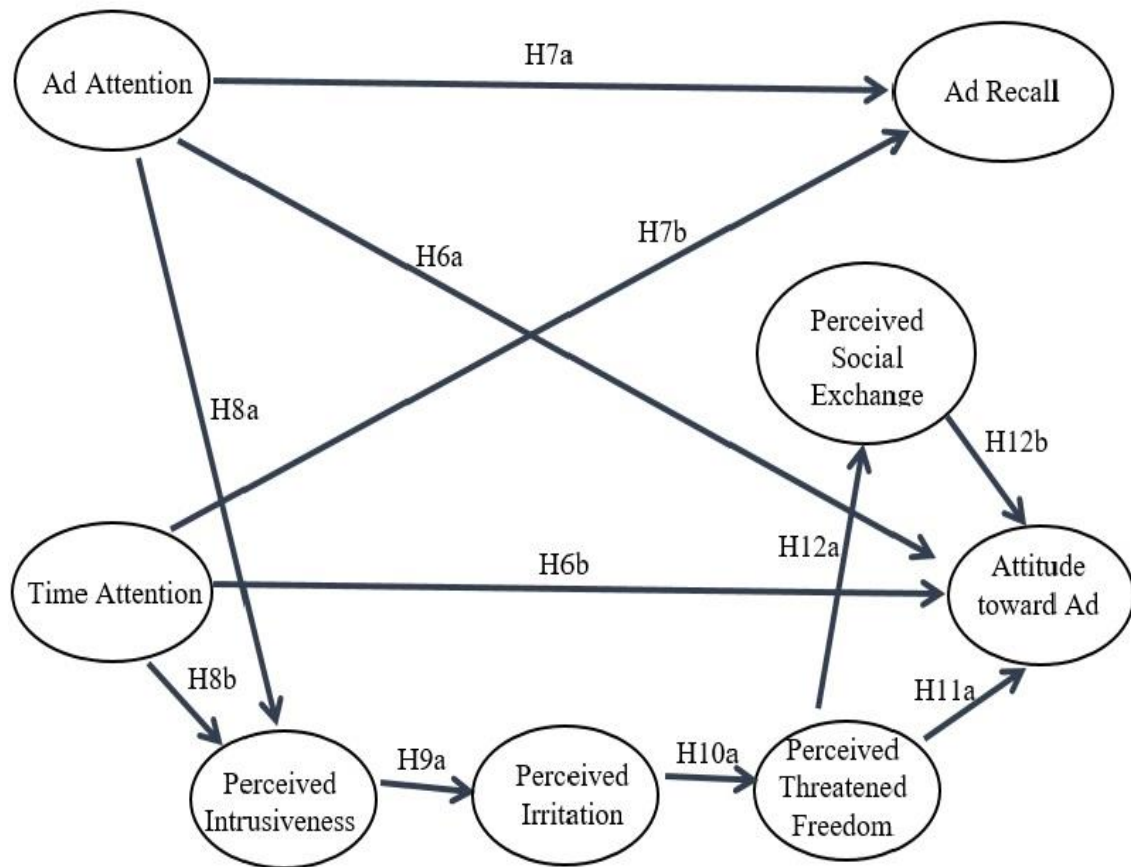


Figure 4-1. Unskippable Pre-Roll Ad Model

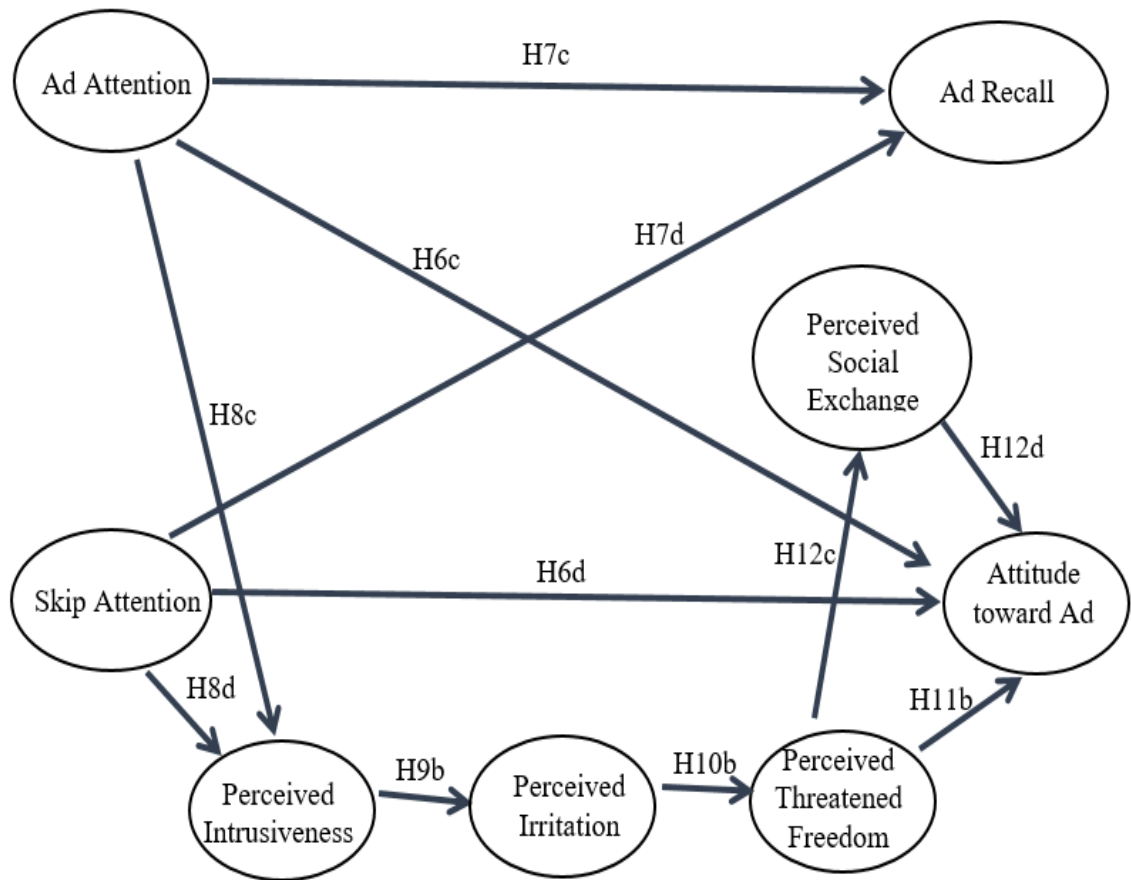


Figure 4-2. Skippable Pre-Roll Ad Model

Methodology

As stated, study 2 examines the effect of dispersed attention on attitude toward the ad and recall of ad content, and creates two different models of the hierarchical paths within each format of pre-roll advertising. Study 2 utilizes a self-administered survey to test the proposed hypotheses. The two experimental stimuli used in Study 1 are used here as well: an unskippable pre-roll advertisement (with the running time of the ad available) and a skippable pre-roll advertisement (with the skip button available).

Sample

Data were collected from Amazon’s Mechanical Turk (MTurk). Three hundred participants per group completed the online survey created in Qualtrics. Likewise in

Study 1, each participant was given 50 cents through the MTurk system, which she or he was linked to via the Qualtrics online survey. A software program offered by Qualtrics kept a participant from taking the survey more than once. Through pre-survey questions, all respondents were regular online video users who have experienced pre-roll ads with/without the skip button. In addition, for clearer differences between two stimuli, the sample of a skippable pre-roll advertisement was made up of only those who skipped the ad in the current study.

Stimulus

The stimuli of Study 2 were exactly same as Group 1's (<https://youtu.be/8zCEzyD4qp0>) and Group 2's (<https://youtu.be/2b4rJRc6OLA>) in Study 1, which were uploaded on *YouTube.com*. While the advertisement for Group 1 displayed the running time of the ad at the bottom left of the screen, the ad for Group 2 showed the skip button at the bottom right, and could only be activated after a minimum of five seconds. Both were 15-second pre-roll advertisements followed by a 1-minute and 53-second movie trailer.

Procedure

Respondents who agreed to participate in the study — called MTurk workers — were given the website address for an experiment and survey (https://ousurvey.qualtrics.com/SE/?SID=SV_cTlgJwvosZrEqhv). Like in Study 1, to obtain unbiased responses about pre-roll advertising, the current study was introduced as a study on use of free online video websites, without mentioning pre-roll advertising (See Appendix A). Participants were directed to a hyperlink for the video clip of the movie trailer, which was linked to *YouTube.com* in a new window. The participants

were randomly assigned into two groups by the software “Randomizer” within Qualtrics. The software randomly assigned the participants into two different versions of the experimental stimulus and its corresponding questionnaire, until three hundred people were in two even groups. The R-code analysis of sample size showed that a total of four-hundred-twenty-two participants (two-hundred eleven participants in each group) were needed to achieve 80% power at two-sided 5% significance level. Group 1 was exposed to an unskippable pre-roll ad embedded in the movie trailer clip and group 2 was exposed to a skippable pre-roll ad. After the participants were shown the entire video clip, they were asked to close the YouTube window and return to the survey questionnaire. As in Study 1, the timer function was set on the page including the hyperlink to the video clip in order to prevent the participants from advancing to the survey questionnaire without watching the video clip. For Group 1, the next button was not activated until two minutes eight seconds later (i.e., 15 seconds for the ad + 1 minute 53 seconds for the movie trailer). Group 2 was supposed to stay on the page at least for 1 minute 58 seconds (i.e., 5 seconds for the ad + 1 minute 53 seconds for the movie trailer) because the participants who did not skip the ad would be excluded from the sample. In the following section, the participants were given specific definitions of free online videos (e.g., short clips on *YouTube.com* and TV shows and movies on *Hulu.com*) and pre-roll ads. Participants were then asked to answer the questionnaire about the experiences concerning the ad they had just watched.

Measurement

For the unskippable pre-roll ad model, a total of eight constructs were assessed: attention to the ad, attention to the running time of the ad, recall of the ad content,

perceived intrusiveness, perceived irritation, perceived threatened freedom, attitude toward the ad, and perceived social exchange. Except for perceived social exchange, the measurements of all other constructs were the same as in Study 1. Perceived social exchange was measured with 7-point Likert scales, ranging from 1 (strongly disagree) to 7 (strongly agree), including the following three items: (1) I understand that watching pre-roll ads is the fee for using the online video service for free, (2) I understand that watching pre-roll ads is a reciprocal exchange for using the online video service for free, and (3) I understand that watching pre-roll ads is a payback for using the online video service for free (Dwyer, Schurr, & Oh, 1987; Thibaut & Kelley, 1959). For the skippable pre-roll ad model, attention to the skip button was measured instead of attention to the running time of the ad.

Measurement reliability was tested using factor analyses and Cronbach's alpha. All scales were found to be internally consistent. One component was extracted from all items for each variable. The statements of items and Cronbach's alphas are displayed in Table 10.

Table 10

Summary of Measures

Construct	Measures	Cronbach's Alpha
Attention to the ad	I paid attention to the ad.	.780 (time)
	I noticed the ad.	.787 (skip)
	I concentrated on the content of the ad.	
Attention to the running time / to the skip button	I paid attention to the running time of the ad / to the skip button.	.922 (time)
	I noticed the running time of the ad / the skip button.	.847 (skip)
	I concentrated on the running time of the ad / the skip button.	
Perceived intrusiveness	Distracting/Disturbing/Forced/Interfering/Intrusive/ Invasive/Obtrusive	.930 (time)
		.915 (skip)
Perceived irritation	Irritating / Phony / Ridiculous / Stupid / Terrible	.917 (time)
		.923 (skip)
Perceived threatened freedom	I felt the ad infringes on my freedom.	.800 (time)
	I felt my freedom is threatened.	.783 (skip)
	The ad forced me to respond.	
Attitude toward the ad	Bad-Good	.963 (time)
	Unfavorable-Favorable	.939 (skip)
	Negative-Positive	
Perceived social exchange	I understand that watching pre-roll ad is sort of a cost for using online video service for free.	.940 (time)
	I understand that watching pre-roll ads is a reciprocal exchange with the online video service for free.	.936 (skip)
	I understand that watching pre-roll ads is a payback for using the online video service for free.	

Analysis

Structural Equation Modeling (SEM) with AMOS 18 was employed to test the hypotheses in the proposed model. To assess the fit of the proposed model, the current study used 1) chi square statistic; specifically the ratio of chi square value to degree of freedom, 2) the goodness-of-fit index (GFI), 3) the normed fit index (NFI), 4) the Tucker-Lewis Index (TLI), 5) the comparative fit index (CFI), and 6) the root mean square error of approximation (RMSEA).

Result

Data Screening

Outliers were checked with Mahalanobis Distance, which is “the distance of the case from the centroid of the remaining cases where the centroid is the point created by the means of all the variables” (Tabachnik & Fidell, 2001, p. 67). The cases with $p < .05$, a total of 134 cases, were deleted from the samples. After outliers were checked, the normality and linearity of the data were checked and confirmed.

Descriptive Statistics

After data screening, 466 participants were valid for the data analysis out of six-hundred responses from the survey. Of these 466 participants, 261 belonged to Group 1, those who watched the unskippable pre-roll ad with the running-time bar below the video clip, and 205 represented Group 2, those who were exposed to the skippable pre-roll ad.

For Group 1, the ratio of gender was 48.7% for female and 51.3% for male. A t-test was conducted to confirm a possible bias from the unbalanced gender distribution. There was no significant difference. The average age of the participants was 36.41 (SD = 11.39) and ranged from 19 to 78. With respect to the use of online video, participants watched free online videos for an average of 6.89 hours per week (SD = 9.28), with a range from 1 to 45 hours per week. The mean value of the frequency in which participants report skipping pre-roll ads was 5.74 (SD = 1.541) and it was also measured with 7-point scales, from 1 (never) to 7 (every time). The website participants most frequently visit to watch free streaming videos was YouTube.com (86.3%) and the favorite video type were short clips (33.8%).

For Group 2, the ratio of gender was 54.6 % for female and 45.4 % for male. The average age of the participants was 36.03 (SD = 11.22) and ranged from 19 to 69. Regarding the use of online video, participants watched free online videos for an average of 7.03 hours per week (SD = 8.24), with a range from 30 minutes to 30 hours per week. The mean value of the frequency in which participants skip pre-roll ads was 6.17 (SD = 1.057), ranging from 1 (never) to 7 (every time). The website participants most frequently visit to watch free streaming videos was YouTube.com (82.5%) and the favorite video type was short clips (36.1%). The summary is displayed in Table 11.

Table 11

Demographics of Groups

	Group 1	Group 2
Gender Ratio (f vs m)	48.7% vs. 51.3%	54.6% vs. 45.4%
Age Distribution	19 to 78 (M=36)	19 to 69 (M=36)
Online Video Use	6.89 (h/week)	7.03 (h/week)
Skip Frequency (1-7)	5.74	6.26
Favorite Website	YouTube (86.3%)	YouTube (82.5%)
Favorite Video Type	Short clips (33.8%)	Short clips (36.1%)

Analysis of Structural Equation Modeling

Prior to model testing, analyses assessed if the scales achieved satisfactory levels of reliability and validity and whether factor loadings significantly related to corresponding constructs. The measurement model including the latent constructs and their respective observed variables was analyzed first, and then the structural model with the hypothesized relationships was tested.

Measurement model evaluation. A confirmatory factor analysis of the full measurement model (See Table 12) showed that all of the indicators significantly

loaded on their corresponding latent construct ($p < .001$). The fit of measurement model for ad running time model was acceptable (Chi Square = 584.089, $df = 254$, $p < .001$, CMIN/DF = 2.300, NFI = .913, TLI = .939, CFI = .949, and RMSEA = .071); and for the skip button model was also acceptable (Chi Square = 481.058, $df = 254$, $p < .001$, CMIN/DF = 1.894, NFI = .895, TLI = .937, CFI = .947, and RMSEA = .066).

Table 12

Standard Regression Weight and Model Fit of Measurement Model

	Running Time	Skip Button
Irritation		
Phony	.757	.780
Ridiculous	.926	.933
Stupid	.926	.910
Terrible	.929	.933
Intrusion		
Distracting	.743	.812
Forced	.762	.720
Interfering	.863	.888
Intrusive	.959	.931
Invasive	.965	.902
Obtrusive	.856	.806
Ad Attention		
I pay attention to the ad.	.918	.905
I notice the ad.	.489	.211
I concentrate on the content of the ad.	.897	.844
Running Time / Skip Button Attention		
I pay attention to the RT/SB of the ad.	.897	.810
I notice the RT/SB.	.933	.804
I concentrate on the RT/SB.	.867	.807
Freedom Threat		
I feel the ad infringes on my freedom.	.403	.229
I feel my freedom is threatened.	.960	.954
The ad forces me to respond.	.948	.915
Advertising Attitude		
The pre-roll ad is bad – good.	.962	.939
The pre-roll ad is unfavorable – favorable.	.923	.880
The pre-roll ad is negative – positive.	.959	.929

Perceived Social Exchange		
I understand that watching pre-roll ad is sort of a cost for using online video service for free.	.906	.917
I understand that watching pre-roll ads is a reciprocal exchange with the online video service for free.	.942	.989
I understand that watching pre-roll ads is a payback for using the online video service for free.	.902	.917
Model Fit		
Chi Square	584.089	481.058
df	254	254
CMIN/DF	2.300	1.894
Normative Fit Index (NFI)	.913	.895
Tucker-Lewis Index (TLI)	.939	.937
Comparative Fit Index (CFI)	.949	.947
RMSEA	.071	.066

Note: * $p < .05$, ** $p < .01$, *** $p < .001$; All factor loadings are significant ($p < .01$).

The convergent and discriminant validity of the latent constructs was examined. Convergent validity was checked in two ways – 1) checking factor loading of each item to the latent constructs, and 2) checking the AVE (Average Variance Extracted) value, which should be higher than .05. As stated, all items were significantly loaded to the correspondent latent constructs ($p < .001$), and all latent constructs' AVEs were greater than .05 in both the ad running time model and skip button model.

Discriminant validity was checked by comparing AVE estimates with MSV (Maximum Shared Variance) and ASV (Average Shared Variance) as suggested by Fornell and Larcker (1981). All AVE estimates of latent constructs were greater than the MSV and ASV estimates in both the running time model and skip button model as shown in Table 13. Thus, both convergent and discriminant validity of latent constructs were obtained.

Table 13

Test of Convergent and Discriminant Validity of Latent Variables

	Running Time			Skip Button		
	AVE	MSV	ASV	AVE	MSV	ASV
Ad Attention	.629	> .272	.120	.525	> .340	.130
Time/Skip Attention	.798	> .135	.041	.651	> .340	.101
Intrusion	.744	> .376	.169	.716	> .453	.199
Irritation	.788	> .362	.181	.794	> .453	.164
Threatened Freedom	.661	> .132	.072	.600	> .120	.055
Social Exchange	.841	> .164	.085	.837	> .049	.024
Attitude	.899	> .376	.199	.840	> .356	.173

Table 14-1 and 14-2 present correlations, covariance, and variance of the latent constructs in the measurement model. All other correlation coefficients were below the recommended threshold of .70 (Tabachnik & Fidell, 2001), which suggest no significant multicollinearity issues. Overall, the results indicated that the scales assessed what they were intended to measure and were reliable.

Table 14-1

Correlation and Covariance Matrix for Running Time Attention Model

	1	2	3	4	5	6	7
1. Ad Attention	2.170	.952	-.684	-.875	.157	.432	1.159
2. Time Attention	.367	3.104	-.038	-.329	.204	.556	.326
3. Intrusion	-.325	-.015	2.042	1.360	.323	-.413	-1.320
4. Irritation	-.376	-.118	.602	2.500	.322	-.949	-1.305
5. Threatened Freedom	.171	.186	.363	.327	.388	-.240	-.237
6. Social Exchange	.196	.211	-.193	-.401	-.257	2.237	.913
7. Attitudes	.522	.123	-.613	-.548	-.253	.405	2.271

Note: Correlations coefficients are presented under diagonal, and covariance is presented over the diagonal, and variance is presented in the diagonal.

Table 14-2

Correlation and Covariance Matrix for Skip Button Attention Model

	1	2	3	4	5	6	7
1. Ad Attention	.676	-.470	-.480	-.317	.063	.084	.442
2. Skip Button Attention	-.583	.960	.472	.206	-.011	.035	-.452
3. Intrusion	-.417	.344	1.957	1.485	.174	-.292	-1.071
4. Irritation	-.245	.133	.673	2.486	.253	-.459	-1.092
5. Threatened Freedom	.164	-.025	.268	.346	.215	-.147	-.149
6. Social Exchange	.071	.025	-.146	-.203	-.221	2.053	.285
7. Attitudes	.419	-.360	-.597	-.540	-.251	.155	1.643

Note: Correlations coefficients are presented under diagonal, and covariance is presented over the diagonal, and variance is presented in the diagonal.

Structural model evaluation. In the unskippable ad model, eight out of eleven total hypothesized relationships among seven latent variables were statistically significant in the directions hypothesized while in the skippable ad model six out of eleven were statistically significant..

In the ad running time model, attention to the ad was negatively associated with perceived intrusiveness ($\beta = -.406, p < .001$; supporting H8a). A significant association was also found between attention to ad running time and perceived intrusiveness ($\beta = .135, p < .05$; supporting H8b). Perceived intrusiveness was positively associated with perceived irritation ($\beta = .607, p < .001$; supporting H9a). Perceived irritation was positively associated with perceived threatened freedom ($\beta = .340, p < .001$; supporting H10a). Perceived threatened freedom was negatively associated with social exchange ($\beta = -.263, p < .001$; supporting H12a) and attitude toward the pre-roll commercial ($\beta = -.248, p < .001$; supporting H11a). Perceived social exchange was positively associated with attitude toward the ad ($\beta = .249, p < .001$; supporting H12b). Finally, while attention to the ad was directly and positively associated with attitude toward the pre-

roll commercial ($\beta = .556, p < .001$; supporting H6a), attention to ad running time was not significantly associated with attitudes toward the pre-roll commercial ($\beta = -.091, p > .05$; not supporting H6b). Both attention to the ad and attention to the running time were not significantly associated with ad recall.

In the skip button model, attention to the ad was negatively associated with perceived intrusiveness ($\beta = -.324, p < .001$; supporting H8c). However, no significant associations were found between attention to the skip button and perceived intrusiveness ($\beta = .169, p > .05$; not supporting for H8d). Perceived intrusiveness was associated with perceived irritation ($\beta = .673, p < .001$; supporting H9b). Perceived irritation was positively associated with perceived threatened freedom ($\beta = .362, p < .001$; supporting H10b). Perceived threatened freedom was negatively associated with social exchange ($\beta = -.227, p < .001$; supporting H12c) and attitude toward the pre-roll commercial ($\beta = -.288, p < .001$; supporting H11b). No significant association was found between social exchange and attitude toward the ad ($\beta = .060, p > .05$; not supporting H12d). As expected, attention to the ad was directly and positively associated with attitude toward the pre-roll commercial ($\beta = .353, p < .001$; supporting H6c). As observed in the ad running time model, attention to the skip button was not significantly associated with attitudes toward the pre-roll commercial ($\beta = -.165, p > .05$; not supporting H6d). Likewise, both attention to the ad and attention to the skip button were not significantly associated with ad recall. The parameter estimates for the proposed structural model are also reported in Table 15.

Table 15

Analysis of Structural Models

Relationship From → To	Running Time	Skip Button	Comparison
	Model	Model	z-score
Ad Attention -- Intrusion	-.406*	-.324*	-.984
Time/Skip Attention -- Intrusion	.135*	.169	.910
Intrusion -- Irritation	.607*	.673*	.857
Irritation -- Threatened Freedom	.340*	.362*	-.588
Threatened Freedom -- Exchange	-.263*	-.227*	-.228
Threatened Freedom -- Attitude	-.248*	-.288*	-.643
Exchange -- Attitude	.249*	.060	2.53*
Ad Attention -- Attitude	.556*	.353*	.087
Time/Skip Attention -- Attitude	-.091	-.165	-1.15
<i>Goodness-of-fit indices</i>			
χ^2 (d.f.)	1,402.326 (576)		
χ^2 /d.f. Ratio	2.435		
Goodness of Fit Index (GFI)	.815		
Normed Fit Index (NFI)	.878		
Tucker-Lewis Index (TLI)	.914		
Comparative Fit Index (CFI)	.924		
RMSEA	.056		

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

The goodness-of-fit indices suggest that the model fit was sufficient; $\chi^2 = 1,402.326$, d.f. = 576, $p < .001$, χ^2 /df ratio = 2.435; GFI = .815; NFI = .878; TLI = .914, CFI = .924; RMSEA = .066. All indices met their threshold level, except GFI and NFI, which is still in the acceptable level.

Lastly, the path comparison between two models was conducted. Significant differences were found in the path from social exchange to attitude (z -score = 2.53, $p < .05$). The result of statistical comparisons is presented in Table 15.

Discussion

The current study was designed (1) to investigate and compare how dispersed attention in a single ad has an influence on attitudes toward the skippable and unskippable pre-roll ad and (2) to examine how negative psychological responses by forceful exposure to the ad, such as perceived intrusiveness, irritation and threatened freedom, are associated with attitudes. This study was also interested in the mediating role of perceived social exchange between such negative perceptions and the attitude. The two different structural models showed the cognitive and emotional process from dispersed attention and psychological reactance to attitude, and offered several implications for the effectiveness of skippable/unskippable pre-roll advertising. Theoretical interpretations of the results and their practical application will be discussed in this section.

The Relationships between Attention and Attitude

The traditional causal relationship between ad attention and attitude toward the ad is likely to still work in the context of skippable and unskippable pre-roll advertising. According to the current results, the positive associations from ad attention to attitude were statistically significant in both contexts of pre-roll advertising. The more attention is paid to a pre-roll ad, the more favorable attitude is formed toward the ad. However, different from ad attention that occurs in the general format of advertising, there are

competitive objects in a skippable and unskippable pre-roll ad that interrupt ad attention, such as the skip button and the running-time of the ad.

Dispersed attention in the unskippable ad. As shown in the unskippable-ad model (See Figure 4-1), free-online-streaming-video users' attention is dispersed into the ad content and the running-time bar buried at the bottom of the ad. The current results show the direct path from attention to the running-time bar to attitude toward the unskippable ad was not statistically significant. That is, when users' attention goes to the running-time bar, that attention is likely to make no contribution to the formation of positive attitude toward the ad.

Dispersed attention in the skippable ad. Figure 4-2 shows that free-online-streaming-video users' attention is dispersed into the ad content and the skip button located at the bottom right corner. Like the unskippable ad model, there was no significant association of attention to the skip button with attitude toward the skippable ad. It seems that bringing users' attention to the skip button does not help to form favorable attitude toward the ad.

Practical implications. Considering attitude as a predictor of advertising effectiveness (Haley & Baldinger, 1991; Mitchell, 1993; Thorson et al., 1992) and attention as an antecedent of attitude (Lavidge & Steiner, 1961; Lee & Ahn, 2012; Olney et al., 1991; Thorson et al., 1992), the current study suggests the importance of ad attention in the context of pre-roll advertising, similar to the cases of other traditional and digital commercials. The results show the differences of attitude toward pre-roll ads when viewers pay attention to the ad and when their attention is dispersed into the running-time bar or the skip button. A series of t-tests were conducted to double-check

and further interpret the results of SEM analysis. In terms of Group 1, who encountered an unskippable ad with the running-time bar, a paired sample t-test revealed a significant difference between attention to the running-time bar and attention to the ad ($t = -2.404$, $df = 260$, $p < .05$). The sample paid more attention to the running time of the ad ($M = 3.43$, $SD = 1.90$) than to the ad content ($M = 3.14$, $SD = 1.58$). With respect to Group 2, who was exposed to a skippable ad with the skip button, there was also a significant difference between attention to the skip button and attention to the ad ($t = -36.496$, $df = 204$, $p < .001$). The skip button ($M = 6.42$, $SD = .99$) grabbed more viewer attention than did the ad content ($M = 2.21$, $SD = 1.06$). Another t-test was conducted to see the difference of attitudes between Group 1 and Group 2. A significant difference was found between the two groups ($t = 4.645$, $df = 464$, $p < .001$). The sample had more favorable attitude toward the unskippable ad ($M = 3.60$, $SD = 1.56$) than toward the skippable ad ($M = 2.96$, $SD = 1.34$). Comparing the mean values (measured in 7-point scales) of attention to the skip button and to the running time, it is not difficult to gauge the difference of attitudes toward the two different formats of pre-roll advertising. The causal sequence of attention and attitude that prior research has supported was confirmed in the current study, too. For the effectiveness of skippable pre-roll advertising, advertising practitioners should look at fundamental ways for free-online-streaming-video users not to skip the ad and to stay focused on the ad content. For example, ad content itself should be able to make a strong impression to hold users' eyes before being skipped, whether it is entertaining or informative. Acknowledging the high skip rate reaching 90% (Elkin, 2016), advertising practitioners need to include the core of the persuasive appeal within the first five seconds of the whole ad run time. Not

only the aspect of content but also the technical features, such as a reward system, can be considered. For instance, when users let the full time of the ad pass without skipping it, they can be given a reward like watching the particular number of other video clips without the ad repeating (limited to the same ad).

The Process of Psychological Reactance

In addition to the relationship between dispersed attention and attitude, the current models describe the hierarchical process of free-online-streaming-video users' psychological reactance to the forced skippable and unskippable pre-roll ads. The basic assumption of the models is as follows: (1) users perceive the forced ad as intrusive, (2) feel irritation about the intrusive ad, (3) are aware freedom to use media is threatened due to the intrusive and irritating ad, and (4) form the attitude on the ad through such psychological reactance. Most hypotheses in the two models were supported and several implications from the results are discussed in this section.

The unskippable-ad model. What is noticeable in the unskippable-ad model is the difference of intrusiveness that users perceived between when attention was paid to the ad and when attention was paid to the running-time bar of the ad. Attention to the ad was negatively associated with perceived intrusiveness whereas attention to the time bar was positively associated with it. This result is parallel to the association of attention with attitude. More attention to the ad refers to less perception of intrusiveness, and more attention to the time bar indicates more perceived intrusiveness. That users keep their eyes not on ad content but on the running time of the ad is one of the available options to avoid the ad in that situation and reflects the passive desire to wait out the ad. This avoidant behavior may be a kind of reactance to the forceful intrusion. As

hypothesized in this model, users' perceptions of ad intrusion aroused irritation toward the ad, followed by perceived threatened freedom, which then negatively affected the attitude toward the ad. The more threatened the freedom of media use was by the intrusive and irritating ad, the less favorable the attitude toward the ad was.

The skippable-ad model. Also in the skippable-ad model, attention to the ad was negatively associated with perceived intrusiveness. Users who pay attention to the ad are likely to feel less intrusion from the ad than do users who try to avoid the ad. However, different from the positive association between attention to the running-time bar and perceived intrusiveness, attention to the skip button was not significantly associated with perceived intrusiveness. Although the mean of perceived intrusiveness toward the skippable ad ($M = 4.97$, $SD = 1.42$) was significantly higher ($t = -4.605$, $df = 463$, $p < .001$) than toward the unskippable ad ($M = 4.32$, $SD = 1.59$), attention to the skip button had no influence on users' perception of intrusiveness. The skippable ad viewers whose goal achievement (watching a video clip) is in sight may feel the ad is more intrusive than do the unskippable ad viewers who are forcefully exposed to the ad. However, the mean of attention to the skip button was 6.42, which may indicate that this attention is very goal-oriented because users' goals can be achieved in five seconds. In other words, attention to the skip button seems to better reflect the strong will to achieve the goal rather than the intention to become avoidant as reactance to the forced ad. Thus, there may be no association between attention to the skip button and perceived intrusiveness. Regarding the associations of other variables from perceived intrusiveness, irritation, and threatened freedom to attitude, this model was valid as hypothesized.

Perceived Social Exchange Leads to Favorable Attitude?

The current study assumed that watching ads may be a type of reciprocity between users and websites, whereby users pay back websites for providing free videos, based on the social exchange theory (Cropanzano & Mitchell, 2005; Emerson, 1976; Tanskanen, 2015). The negative perceptions that occur by psychological reactance to the forced pre-roll ad run counter to the perception of reciprocity. While psychological perceptions such as intrusiveness, irritation, and threatened freedom are perceived as emotional aspects, the purpose of social exchange would be functionally perceived. Thus, the current study expected that the functional thought might alleviate users' emotional reactance. In other words, the sequence of negative variables linked from perceived intrusiveness and irritation to threatened freedom is mediated by perceived social exchange, which may contribute to the formation of better attitudes toward the ad. For the unskippable-ad model, as expected, perceived threatened freedom was negatively associated with perceived social exchange. Perceived social exchange was positively associated with attitude toward the ad. If free-online-streaming-video users understand the forced ad and free videos as the reciprocal relationship of cost and reward, they may be relatively more favorable toward the ad, even though their freedom of media use is somewhat restricted by the ad. However, for the skippable-ad model, there was no significant association between perceived social exchange and attitude whereas perceived threatened freedom was negatively associated with perceived social exchange. Users' perception of social exchange as a mediating variable had no influence on attitude toward the skippable pre-roll ad. Based on psychological reactance theory (Brehm, 1966), skippable ad viewers may think that they can have the

opportunity to restore their threatened freedom by the forced ad through the skip function. Thus, for them, watching the skippable ad may not be the cost for free videos.

CHAPTER 4. Conclusion

The idea of the current study started from the question: “Are skippable pre-roll ads indeed effective?” In conclusion, they are not, at least in comparison with unskippable ones. Based on the assumptions of psychological reactance theory (Brehm, 1966), this study predicted that free-online-video users would have more positive psychological responses and more favorable attitude toward the skippable pre-roll ad, which gives the opportunity to avoid the forcefully exposed ad by skipping it (i.e., to restore threatened freedom), than the unskippable pre-roll ad. However, although attitudes toward the pre-roll ad did not significantly differ in both the skippable and unskippable situation, Study 1 showed that viewers were likely to feel less intrusiveness, irritation, and threatened freedom about the unskippable pre-roll ad than the skippable one. As mentioned in Study 1’s discussion, viewers might have emotional inertia through prior experience about the unskippable ad or might have more stress and tension from the delay of imminent goal achievement in the skippable condition. Study 2 found a negative association between psychological reactance and attitude, one of the most representative predictors for ad effectiveness. Thus, the unskippable pre-roll ad showing the running time, which is perceived as less intrusive and irritating, may be a more effective format of pre-roll advertising than the skippable one. Higher levels of ad attention and ad recall in the unskippable situation, compared to the skippable situation, can be further evidence of better ad effectiveness. The current study provided no evidence that the skip function alleviates negative perceptions of advertising.

In terms of ad attention, both Study 1 and Study 2 identify the traditional importance of ad attention to increase the effectiveness of pre-roll advertising. Paying

more attention to both the skip button and the running time of the ad than to the ad content is regarded as typical goal-directed behavior. A pre-roll ad embedded in a main content video is not in free-online-video users' interests. Thus, attention is challenged when a viewer whose goal is to watch a main content video encounters a pre-roll ad, either with the skip button or without it. Because the skip button directs the viewer to his/her goal, it can be a top-down factor. Paying less attention to the ad despite the lack of skip button indicates the viewer's strong desire to accomplish his/her original goal. As the running time of the ad decreases, the viewer comes closer and closer to reaching his/her goal. Advertisers and marketers need to consider creating goal-relevant ads that can receive attention priority. To do so, pre-roll ads may be more effective when they are more personalized and more involved with main content videos.

Limitation and Future Research

The effectiveness of unskippable pre-roll advertising showing its running time might be supported in the current experimental design using advertisement stimulus whose brand is less familiar and less involved. However, what if a brand from a skippable ad is shown briefly but repeatedly for five seconds? The effect of mere exposure may be overlooked in the current study; assuming that attitudinal responses occur when ad exposure is so brief that its presence is hardly recognized. The theory of mere exposure proposes that brief and repeated exposure to a stimulus can encourage audiences to have familiarity and a more favorable attitude toward the stimulus unconsciously (Kunst-Wilson & Zajonc, 1980; Zajonc, 1968). As such, affect and cognition are shown to be processed independently (Zajonc, 1968), and many studies have revealed this unconscious effect of exposure (Coates, Butler, & Berry, 2006;

Gardiner & Richardson-Klavehn, 2000; Goodrich, 2011; Kunst-Wilson & Zajonc, 1980; Lee, 2002; Zajonc, 1968). Because the mere exposure effect tends to occur in a low-attention situation and the influence of incidental mere exposure is stronger when subjects are not aware of the exposure, the level of attention has been shown to be negatively associated with attitude (Goodrich, 2011). More specifically, according to a study by Bornstein and D'Agostino (1992), attitude toward the merely exposed stimulus was higher when exposure durations were shorter and exposure frequency was higher whereas, longer exposure weakened attitude but increased recognition.

Returning to the context of pre-roll advertising, it is hard to evaluate whether the mere exposure effect will occur because of the inherent nature of the ad format, despite a brief exposure for five seconds the ad could still be skipped. A recent study by Krishnan and Sitaraman (2013) reported that online video ads embedded in video clips, including pre-roll, mid-roll, and post-roll ads, tend to place audiences in the more elaborate situation of ad exposure. More specifically, media (e.g., computers or mobile devices) do not separate audiences from ads, which are naturally included in the media content; thus, the subject of and the object of exposure both are involved with each other. That is, it does not appear that the relationship between attention and attitude is affected by the mere exposure effect merely because of the short duration of exposure or divided condition of attention. However, on the nature of YouTube pre-roll advertisements, which tend to be displayed repeatedly for a particular time period, a question may arise about the frequency of exposure. If viewers are more frequently exposed to the same commercial, there will be mere exposure effects despite just five-second exposures. The multiple exposures can be another topic for future research.

Theoretical Contributions of the Study

This study offers insight into the extension of theories by applying a neurophysiological perspective to advertising research. As confirmed in the modified hierarchy of effects models in Study 2, grabbing ad attention is a very basic but important step to increase the effectiveness of advertising. In light of this, understanding the mechanism of ad attention from the neurophysiological perspective was significant for the current study examining the effects of skip function in pre-roll advertising. More specifically, the current study investigated why free-online-video users pay less attention to ad content and more attention to the skip button or the running-time bar, and revealed that most users pay goal-oriented attention to those objects competitive with ad content. Thus, the current study makes a theoretical explanation of competition system of attention and suggests the theory of attention competition as an appropriate framework for other ad attention studies. New ideas from various theoretical applications provide a base for future research. Currently, this study measured self-reported attention, but future research will include an experiment to examine actual attention to objects on pre-roll advertising (e.g., using eye tracking), and to investigate information processing in five-second designs.

The current study tested the assumptions of psychological reactance theory, which were not supported with the current data. Free-online-video users were more negative toward the skippable pre-roll ad that gives the opportunity to restore threatened freedom than toward the unskippable ad that is passively exposed in the condition of psychological resignation. This psychological reactance to the skippable ad implies users' goal-oriented tendency, which advertising practitioners need to consider for ad

marketing. They should focus more on ad content grabbing users' goal-oriented attention rather than providing a tool to restore threatened freedom like the skip button. As seen in the current models, it is important to reduce negative aspects consumers may feel toward the ad.

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Appendix A. Survey

Instructions of MTurk

I am conducting an academic survey about the use of free online video websites (e.g., YouTube.com). I need to understand your experiences and feelings when you use the websites. Select the link below to complete the survey. At the end of the survey, you will receive a code to paste into the box below to receive credit (\$.50) for taking our survey. *Make sure to leave this window open as you complete the survey.* When you are finished, you will return to this page to paste the code into the box.

Survey link: https://ousurvey.qualtrics.com/SE/?SID=SV_cTlgJwvosZrEqhv

Provide the survey code here: _____

Cover Letter

To Research Participant:

You are being invited to participate in a study on free online video websites (e.g., YouTube.com and hulu.com). The primary investigator of this study is Sang Chon Kim, from the University of Oklahoma. The purpose of the current study is to understand your specific experiences and feelings when using free online video websites.

The survey will take approximately 7 to 10 minutes to complete. The procedure is as follows: (1) you are directed to a hyperlink for a video clip, which is uploaded on YouTube.com, (2) you watch a 1-min-53-second movie trailer, titled “Big Hero 6,” (3) you close the YouTube window and are back to the survey, and (4) you start to fill out the questionnaire.

I would be very appreciative if you complete the entire survey. Your participation would be very helpful for my study. If you have any question about the study or survey, please feel free to contact me at sckim@ou.edu. Thank you in advance for your assistance with the current study.

Sincerely,

Sang Chon Kim

Gaylord College of Journalism & Mass Communication

University of Oklahoma

Survey Questionnaire

Please read and follow the instruction carefully.

This survey asks you about your specific experiences and feelings when using free online video websites.

You watch a 1-min-53-second movie trailer, titled “Big Hero 6,” an American family animation produced by Walt Disney in 2014. You are directed to YouTube.com (with a new window) by clicking the YouTube hyperlink below and the movie trailer is played. After watching the clip, you close the YouTube window and are back to the survey. Then, you click the NEXT button.

Big Hero 6 Official Trailer: <https://youtu.be/8zCEzyD4qp0> (Group 1)
<https://youtu.be/2b4rJRc6OLA> (Group 2)
<https://youtu.be/r2MQEkgQ3F4> (Group 3)

Section A.

Please answer the questions by clicking the boxes or typing in the answers.

1. Have you ever watched free streaming videos (e.g., youtube.com and hulu.com)?

- 1) Yes _____
- 2) No _____

2. How often do you watch free streaming videos? _____ hour(s) / week

3. Please type in the name of the website you most frequently visit to watch free streaming

videos (e.g., youtube.com and hulu.com) and the type of the videos (e.g., movies, TV shows, short clips, etc.)

Website name: _____

Video type: _____

4. Have you ever encountered pre-roll ads with the skip button in free streaming videos? (pre-roll ad: the video ad clip running before you watch main content video)

- 1) Yes _____
- 2) No _____

5. How often do you skip the pre-roll ads?

Never o o o o o o o Every time

6. Did you skip the ad you've just watched? (Only for Group 2)

1) Yes _____

2) No _____

6-1. Why did you skip the ad? _____

Section B.

The next series of questions asks what you remember from the pre-roll ad you've just watched. Please answer the question by typing in the answers.

1. Can you recall the name of brand? (Y / N)

If yes, what was the name of brand? _____

2. Can you recall the category of product? (Y / N)

If yes, what was the category of product? _____

3. Can you recall the ad copy? (Y / N)

If yes, what was the ad copy? _____

4. Can you recall the first word shown in the ad? (Y / N)

If yes, what was the first word shown in the ad? _____

5. Can you recall the place of the first scene? (Y / N)

If yes, where was the location of the first scene? _____

Please take a few seconds to remember the pre-roll ad that you've just watched.

Section C.

The next series of questions asks you about your experiences and feelings toward the pre-roll ad.

The pre-roll ad was:

1. Irritating.

Strongly disagree Strongly agree

2. Phony.

Strongly disagree Strongly agree

3. Ridiculous.

Strongly disagree Strongly agree

4. Stupid.
Strongly disagree Strongly agree
5. Terrible.
Strongly disagree Strongly agree
6. Distracting.
Strongly disagree Strongly agree
7. Disturbing.
Strongly disagree Strongly agree
8. Forced.
Strongly disagree Strongly agree
9. Interfering.
Strongly disagree Strongly agree
10. Intrusive.
Strongly disagree Strongly agree
11. Invasive.
Strongly disagree Strongly agree
12. Obtrusive.
Strongly disagree Strongly agree

When I watched the pre-roll ad,

13. I paid attention to the ad.
Strongly disagree Strongly agree
14. I noticed the ad.
Strongly disagree Strongly agree
15. I concentrated on the content of the ad.
Strongly disagree Strongly agree
16. I paid attention to the running time of the ad (for Group 1) / the skip button (for Group 2).
Strongly disagree Strongly agree
17. I noticed the running time of the ad (for Group 1) / the skip button (for Group 2).
Strongly disagree Strongly agree
18. I concentrated on the running time of the ad (for Group 1)/the skip button (Group 2).
Strongly disagree Strongly agree
19. I felt the ad infringes on my freedom.
Strongly disagree Strongly agree
20. I felt my freedom is threatened.

Strongly disagree Strongly agree

21. The ad forced me to respond.

Strongly disagree Strongly agree

22. In your opinion, the pre-roll ad was:

Bad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Good
Unfavorable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Favorable
Negative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Positive

23. What brought your attention to the ad? _____

24. What brought your attention to the running time of the ad (for Group 1) or the skip button (for Group 2)? _____

*The questions from 16 to 18 are not applicable to Group 3.

Section D.

The next series of questions asks you about your feelings towards the pre-roll ad. Please indicate the extent to which you agree or disagree with each of the following statements by checking one box that best reflects your opinion.

1. I feel grateful to the pre-roll ad in free streaming video because it enables me to watch the content for free.

Strongly disagree Strongly agree

2. I feel thankful to the pre-roll ad in free streaming video because it enables me to watch the content for free.

Strongly disagree Strongly agree

3. I feel appreciative to the pre-roll ad in free streaming video because it enables me to watch the content for free.

Strongly disagree Strongly agree

4. I understand that watching pre-roll ads is sort of a cost for using the online video service for free.

Strongly disagree Strongly agree

5. I understand that watching pre-roll ads is a reciprocal exchange with using the online video service for free.

Strongly disagree Strongly agree

6. I understand that watching pre-roll ads is a payback for using the online video service for free.

Strongly disagree Strongly agree

7. What are the chances that you will continue to skip pre-roll ads in the future?

Unlikely	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Likely
Improbable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Probable
Impossible	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Possible

Section E.

Please indicate the extent to which you agree or disagree with each of the following statements on your general feeling toward advertising.

Advertising is:

1. Helpful.
Strongly disagree Strongly agree
2. Important.
Strongly disagree Strongly agree
3. Informative.
Strongly disagree Strongly agree
4. Useful.
Strongly disagree Strongly agree
5. Attractive.
Strongly disagree Strongly agree
6. Enjoyable.
Strongly disagree Strongly agree
7. Entertaining.
Strongly disagree Strongly agree
8. Fun to watch.
Strongly disagree Strongly agree
9. Overall I find advertising positive.
Strongly disagree Strongly agree
10. Overall I feel favorable toward advertising.
Strongly disagree Strongly agree
11. Overall I like advertising.
Strongly disagree Strongly agree

Section F.

1. How old were you on your last birthday? _____
2. What is your gender?

- o Female
- o Male

Thank you for your participation!