FORCED EXPOSURE TO ONLINE VIDEO ADS: THE ROLE OF PERCEIVED CONTROL AND DESIRE FOR CONTROL

by

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ABSTRACT

This study explored how online video ad control features might influence viewer experiences with online video advertising. In particular, the study examined the impacts of an ad skip option and a remaining ad time display on psychological reactance and attitudinal response to the video ad. The study also investigated the mediating role of perceived control and the moderating role of desire for control (DFC). The results of a 2 (Skip option: presence vs. absence) \times 2 (Time display: presence vs. absence) between-subjects experiment revealed that viewers perceived higher control over the ad and lower ad intrusiveness and lower ad irritation when the ad skip option was available than when the ad skip option was not available. However, the presence of the skip option did not result in more favorable attitude toward the ad (A_{ad}) or attitude toward the brand (A_b). Similarly, the presence of the ad time display led to higher perceived control over the ad and lower ad intrusiveness and lower ad irritation but did not lead to more favorable A_{ad} or A_b than the absence of the ad time display. Moreover, the results show that the pathway from perceived control to psychological reactance mediated the effects of the two online video ad control features on A_{ad}. Lastly, DFC did not significantly moderate the impact of perceived control on psychological reactance.

INDEX WORDS: Online Video Advertising, Perceived Control, Desire for Control, Psychological Reactance, Ad Skip Option, Ad Time Display

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DEDICATION

To my family: my loving wife, mother, father, and sister.

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CHAPTER 1

INTRODUCTION

The status of "being in control" is known to be a basic human need (White 1959; Deci and Ryan 1985; Bandura 1977). With advancements in technology, digital media platforms have granted Internet users a substantial amount of control that is not possible in traditional media. Indeed, while traditional TV viewers can merely change channels and volume level using a remote control, Internet users can freely navigate to a wider variety of content and engage in a greater variety of activity at their own pace. Naturally, the primary platform for media consumption has moved from traditional media to digital media across the globe (Accenture 2015). For example, traditional TV viewing time among 18-24 year olds in the United States has dropped by 38% over the past five years (Nielsen 2016). At the same time, digital video streaming time among Millennials (18-34 year olds) has more than tripled between 2013 and 2015 (MarketingCharts 2017). In the United States, the average individual watches online videos for an hour every day (eMarketer 2015), and video watching is estimated to account for 80% of Internet traffic by 2018 (Cisco Systems 2014). The number of videos available online is likely impossible to count. YouTube alone generates 300 hours of new videos every minute (YouTube 2017), and 100 million hours of video are watched everyday on Facebook (Facebook 2016). In addition to virtually unlimited choices in content, digital media platforms allow users to interact with content in various ways. Internet users can respond to content, share information about content with others, and pass content along to their friends.

Unfortunately, this great amount of user control over video content on digital media does not guarantee user control over advertising exposure. Like any other media content, the fundamental reason that online media providers can offer unlimited accessibility to video content is advertising income. In step with increasing digital video consumption, the amount of money that advertisers spend to distribute online video advertising continues to grow (eMarketer 2016). Digital technology has changed how users interact with media content; however, the way digital advertising is presented to users has not changed much from the way traditional advertising is presented. Most online video ads are forcibly shown to viewers before, during, or after primary video content (Brechman et al. 2016). To be sure, these in-stream video ads grab user attention more easily than other forms of online advertising, increasing click-through rate and brand awareness (Li and Lo 2015; Benway 1998). However, in-stream video ads usually interrupt the media viewing experience. Many studies have pointed out the intrusiveness and potential negative consequences of in-stream video ads. The intrusive nature of forced ad exposure is particularly problematic in an online environment. First, because digital media platforms provide a greater level of user control than traditional media, Internet users have higher expectations of control over their media experience. Therefore, temporary elimination of that control through forced ad exposure is likely to be more detrimental to Internet users than traditional media audiences. Second, digital media platforms do not provide media content automatically, as television networks and radio stations do. Internet users must actively engage in searching for the media content they want. Therefore, they tend to have a more goal-oriented mindset than traditional media audiences. Not surprisingly, Internet users tend to show stronger reactance when advertising interrupts their primary task (Dreze and Hussherr 2003).

For these reasons, one of the most crucial concerns for online marketers and publishers is the intrusive nature of online video ads. A common way to attenuate the negative consequences of online video ad intrusiveness is the ad skip option, which allows users to skip an ad and go back to the primary video content after 5 seconds of forced exposure. In 2010, YouTube first introduced TrueView in-stream advertising, a skippable video ad format, to the online video ad industry. YouTube claims that TrueView is a more accurate measure of advertising engagement than a simple count of ad exposures because advertisers are only charged when a viewer watches the whole ad or at least 30 seconds of an ad. Studies have confirmed that the TrueView ad format can satisfy both advertisers and content owners without sacrificing the viewing experience of an end-user (Pashkevich, DoRai-Raj, Kellar, and Zigmond 2012). In a similar vein, McCoy, Everard, Polak, and Galletta (2008) demonstrated that having the option to remove a pop-up ad reduced feelings of intrusiveness. The option to skip a video ad is a behavioral control that enables one to modify one's experience. Another way to generate the perception of "being in control" is endowing the ability to understand what is happening in one's environment by obtaining and assessing relevant information, what Averill (1973) referred to as "cognitive control." In this regard, online video streaming sites and social networking sites often show countdown timers on in-stream ads to indicate the amount time left before the primary video content will resume. This ad feature is also absent in traditional media. Yu, Chan, Zhao, and Gao (2012) found that presentation of time information during ad exposure influences ad effectiveness. The authors observed that displaying the remaining time of an ad and the number of remaining ads enhanced ad memory.

Despite the prevalent use of the ad skip option and ad time display in digital media, few experimental studies have investigated whether they reduce ad intrusiveness of online video ads.

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Since ad intrusiveness is one of the critical concerns for online advertisers (Goodrich, Schiller, and Galletta 2015), understanding how these digital tactics influence the viewer's experience with online video advertising could help online advertisers minimize ad intrusiveness and maximize ad effectiveness. Thus, the primary purpose of the current study was (a) to examine how ad skip option and ad time display impact viewer response to online video ads and (b) to investigate the underlying mechanism of this impact. In particular, the current study investigated how perceived control might mediate the effects of an ad skip option and an ad time display on ad intrusiveness. Positing that the presence of these features might increase perceived control over ad exposure, the current study hypothesized that this effect would be moderated by the viewer's general desire for control. As consequences of increased perception of control over ad exposure, psychological reactance to an ad and the subsequent negative impact on ad effectiveness were predicted to decrease. Since ad intrusiveness is one of the critical concerns for online advertisers, the study would provide valuable insights.

This dissertation is structured as follows. Chapter 1 introduces the study. Chapter 2 reviews the literature on the concept of ad intrusiveness and psychological reactance theory and discusses the effect of perceived control on the physical and mental conditions of an individual. Chapter 3 describes the research methods, and Chapter 4 details the results of the experimental study. Chapter 5 summarizes the findings and discusses implications for both advertising scholars and practitioners. Limitations and suggestions are outlined for future research in the area.

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CHAPTER 2

LITERATURE REVIEW

Emergence of Online Video Advertising

Online video ads refer to any type of video ad made available online, including display video ads, branded video content, and in-stream video ads. In the current study, however, the term "online video ad" refers specifically to in-stream video ads that are inserted into online video streaming content. The Interactive Advertising Bureau (IAB) (2016) defines online video ads as "linear or non-linear ad formats served into a video player before, during, and after a variety of content including, but not limited to, streaming video, animation, gaming, and music video content in a player environment." The current study focused exclusively on linear video ad formats that completely interrupt streaming video content, as opposed to nonlinear video ads that overlay video content. Although online video ads work much like television commercials, interrupting original video content, the former are much more flexible regarding placement, loading, and duration. Online video ads can be placed anywhere between the beginning and end of a video. Moreover, the level of ad loading can vary (Brechman 2016). Online video ads are more likely to be presented individually while TV commercials are shown as a cluster of sequential commercials (six to eight consecutive ads). In addition, linear in-stream video ads can have duration from 3 to 60 seconds (IAB 2016) while the length of a TV commercial is typically 30 seconds. Beyond format flexibility, online video ads offer many benefits to advertisers. One prominent benefit is targeting options. Based on the demographics, geography, and browsing behavior of an Internet user, online video ads can accurately target the intended audience.

Moreover, online video ads allow users to perform a variety of actions, such as clicking a link to a brand's web page, where they can make a connection with a brand or even make a purchase. Lastly, online video ads are not easily ignored by a user. The online media environment is cluttered with advertising, causing Internet users, especially younger users, to be blind to most online ads (Burke, Hornof, Nilson, and Gorman 2005). However, online video ads are designed to capture attention by interrupting a video viewing experience. In other words, viewer attention spills over to the ad, producing a positive effect on ad message processing (Lloyd and Clancy 1991). When a video ad is embedded in the middle of the video content that viewers are engaged with, their flow of intense attention does not instantly cease when a video ad interrupts the primary video content (Moorman Willemsen, Neijens, and Smit 2012). Moreover, this increased attention to in-stream video ads impacts brand memory. A recent study from Li and Lo (2015) confirmed that in-stream ads placed in the middle of video content led to better brand name recognition than in-stream ads placed before or after video content. Due to the advantages of online video ads, 72% of 120 U.S. advertising agencies believe that online video ads are as effective as, if not more effective than, TV commercials (BrightRoll 2015).

Intrusiveness of Online Video Advertising

Advertisers might think that online video ads are the perfect tool to increase brand recall and click-through rate in an ad-cluttered environment, but online video ads do have downsides that can damage the attitudinal responses of viewers. Even though online video ads can attract attention and enhance brand memory, their intrusive nature can negatively impact perceptions of and feelings about the advertising brand (Goodrich, Schiller, and Galletta 2015). Advertising research has shown that these negative impacts results in ad intrusiveness and irritation. Edwards, Li, and Lee (2002) have defined intrusiveness as "the degree to which a person deems the presentation of information as contrary to his or her goals" (p. 85). Therefore, an advertisement can be perceived as intrusive when it is perceived as less valuable than the primary content it interrupts (Pasadeos 1990). Meanwhile, advertising value is closely related to an evaluation of the informational and entertaining aspects of an ad (Ducoffe 1995, 1996). In this way, ad informativeness and ad entertainment can predict perceived ad intrusiveness (Edwards, Li, and Lee 2002). In step with these findings, Goodrich et al. (2015) confirmed that informational and humorous video ads actually reduce levels of ad intrusiveness. In the context of pop-up ads, Edwards et al. (2002) further identified (a) congruence between ad content and the current task in which a user is engaged and (b) the cognitive intensity of that engagement as antecedents of perceived ad intrusiveness. Advertising studies have continually supported the idea that contextual relevance of ads to media content reduces perceived ad intrusiveness (van Reijmersdal, Neijens, and Smit 2005; Ying et al. 2009) and increases advertising engagement (Kim, Ahn, Kwon, and Reid, 2017). Accordingly, advertisers have actively used digital technologies to present their ads in a relevant media context.

In terms of audience, forced exposure to advertising might be more detrimental in digital media than traditional media. Users tend to engage in more goal-directed tasks in an online environment, such as information seeking, social interaction, and online shopping. Therefore, they are more active and more likely to be in a "lean forward" mode while engaged in an online environment (Nielson 1997). Thus, users in online environments tend to feel a heightened level of intrusiveness when unsolicited ads appear (Dreze and Hussherr 2003). Furthermore, perceived ad intrusiveness leads to negative emotional and behavioral outcomes such as ad irritation and ad avoidance (Speck and Elliott, 1997; Park and McClung 1986; Krugman 1983; Kennedy 1971), potentially leading to negative impacts on advertising effectiveness, including unfavorable

attitudes toward the ad and brand (Goodrich et al. 2015; Rettie 2001; MacKenzie and Luts, 1989).

Psychological Reactance Theory

Threats to Freedoms. Psychological reactance theory (Brehm and Brehm 1981) provides valuable insights into the negative responses that viewers have to online video ads. The fundamental assumption of this theory is that when individuals perceive a threat to their freedom, they become motivated to secure that freedom from the threat. In particular, the theory specifies what constitutes a freedom, how a freedom might be threatened, and how individuals respond to those threats. According to the theory, individuals believe they should have autonomy to engage in "free behaviors," which refer to the physical and mental abilities to engage in an activity and the knowledge of those abilities. The freedoms addressed by this theory are specific behavioral realities (e.g., buying a specific car) rather than abstract considerations (e.g., having a fantasy). Nevertheless, people encounter a variety of situations in which they perceive an obstacle to reaching a potential outcome. These situations represent threats to freedom, and the threats can arise from internal or external factors. Internal threats can arise from decision making (i.e., choosing specific options and rejecting others). For instance, if one chooses to buy a car from a specific brand and rejects other options, internal threats might arise from not being able to choose other options. External threats might occur from social influence, such as being persuaded to buy a car from specific brand by a salesman. In addition, external threats can arise from impersonal situational factors that create obstacle to individual freedom, such as unavailability of specific products or services. Yet because the theory assumes that a freedom is a belief, which can vary in its certainty, reactance can be aroused in individuals only to the extent that they believe they have freedom to control potential outcomes.

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Determinants of the Degree of Reactance. The degree of reactance depends on four main determinants: (a) the importance of the threatened freedom, (b) the number of threatened freedoms, (c) the perceived magnitude of the threat, and (d) the implication(s) of the threat. First, the more important the freedom, the greater the reactance will be. Freedom to choose among alternative job positions is more important than the freedom to choose between two T-shirts. Therefore, reactance toward a threat will be greater in the former case. Second, the higher the number of threatened freedoms, the greater the reactance will be. Prohibiting two out of three options results in greater reactance than restricting one out of three options. Third, stronger threats such as the elimination of a choice or the pressure to do certain behavior lead to greater reactance than weaker threats like a persuasion or a recommendation. Lastly, when implied threats exist alongside the real ones, the degree of reactance is likely to be greater. When a worker is prohibited from eating snacks while working, the reactance might arise not only from the loss of freedom to snack but also from the implied loss of freedom to take a break or chat with others. The degree of reactance increases as the degree of any of these four determinants increases. However, when individuals experience absolute threats, in light of which they are convinced that certain outcomes are absolutely uncontrollable, they experience learned helplessness and are likely to give up wanting that outcome (Wortman and Brehm 1975). In this state, individuals do not experience reactance.

Effects of Reactance. The activation of psychological reactance can result in emotional, behavioral, and cognitive responses. First of all, reactance is an unpleasant motivational state in which people feel negative emotions such as discomfort, hostility, anger, and aggression (Brehm 1966; Dillard and Shen 2005; Rains 2013). In addition, threatened people might engage in certain behaviors in order to reassert their freedom. The most direct way to preserve or maintain

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threatened freedom is to engage in the restricted behavior. For instance, an adolescent might start to smoke tobacco after frequent exposure to anti-tobacco messages (Henriksen, Dauphinee, and Wang 2006). When people cannot, or at least believe that they cannot, perform a prohibited behavior, indirect restoration of that belief can still be achieved by engaging in behaviors that are similar to the threatened behavior or observing others engaging in the threatened behavior. On the cognitive side, people might negatively evaluate the source of a perceived threat, overestimate the attractiveness of a threatened freedom, or underrate alternative behaviors.

Individual Differences in Psychological Reactance. Brehm (1966) first conceptualized the concept of reactance as a hypothetical variable that cannot be measured directly. However, subsequent studies have continually proposed that reactance can be measured directly by assessing the subjective experience of threats to freedom. The Hong Reactance Scale (Hong 1992) and the Therapeutic Reactance Scale (Dowd, Milne, and Wise 1991) are the two most frequently used instruments to assess reactance as a behavior that varies across individuals. While these scales assume a one-factor structure of reactance, Dillard and Shen (2005) conceptualized reactance as a combination of anger affect and negative cognition and suggested a multi-dimensional model. In an attempt to assess reactance, Jonas et al. (2009) combined items measuring perception of threat to freedom with items measuring emotional experience. De las Cuevas et al. (2014) also suggested the concept of reactance as a two-factor structure with affective and cognitive dimensions. Although the concept of reactance was not originally discussed as a personality trait, some studies have found individual differences in psychological reactance. In fact, personality type was found to be a significant predictor of individual reactance level. "Thinkers" on the Myers-Briggs Type Indicator (MBTI) personality test showed higher levels of psychological reactance than "Feelers" (Buboltz et al. 2003). Age, ethnicity, and gender have also been found to be closely related to psychological reactance (Woller, Buboltz, and Loveland 2007). The relationship between age and reactance level is curvilinear, with younger and older people have higher reactance levels than middle-aged people. Regarding ethnicity, African Americans, Hispanics, and Asians tend to exhibit higher reactance than Caucasians and Native Americans. In terms of gender, men showed higher levels of reactance than women.

Reactance Theory and Buying Decisions. Since Jack Brehm first theorized about psychological reactance in 1966, the concept has received substantial academic attention in the fields of mass communication, psychology, marketing, education, and politics. Today's consumers enjoy numerous freedoms to choose in a variety of situations. Thus, experiencing the threats to freedom in making buying decisions often induce psychological reactance. Comparing two experimental conditions, high and low pressure, in a persuasion encounter, Wicklund, Slattum, and Solomon (1970) found that the stereotypical high-pressure salesperson generated a boomerang effect. Subjects confronted with the high-pressure salesman showed less favorable attitude toward the product than subjects who met the low-pressure salesman. The authors explained that subjects who faced the high-pressure salesman rated the product less favorably in order to manifest their desire to retain their freedom not to prefer the product, a desire that ran counter to the aim of the persuasion. Findings from that study are consistent with the prediction of psychological reactance theory. Yet the results are still subject to alternative explanations, including the personal qualities of the salesperson and the credibility of the source. Mazis, Settle, and Leslie (1973) examined the effect of psychological reactance by interviewing homogeneous subjects simultaneously in two Florida cities that had different regulations on the use of detergent products. They found that consumers in Miami, who were forced to switch from phosphate detergent to another detergent, rated the alternative as less efficient than consumers from Tampa,

who were given the freedom to choice among alternatives. However, the results of this field experiment should be interpreted with caution because the researchers could not control various factors, such as differences in primary attitude toward the detergent brand and the marketing activities of the brand in the two cities. Fitzsimons and Lehmann (2004) found that even advice from experts could activate consumer reactance. Especially when the advice was unsolicited and contradicted initial impressions, consumers not only ignored the recommendations but also intentionally contradicted them. This finding is consistent with Wicklund et al. (1970), suggesting that people show strong reactance to unsolicited persuasion. Building on reactance theory, Levav and Zhu (2009) examined how spatial confinement affected consumer choices. Findings indicate that when consumers perceived spatial confinement (e.g., size of a room), they tended to seek more variety and uniqueness in their choices in an attempt to restore their freedom indirectly. In particular, consumers who had chronically high levels of reactance were more influenced by the confinement than those with low levels of reactance. This study is distinct from the others in demonstrating people's indirect restoration of freedom by through behavior that could counterbalance the loss of spatial freedom. Moreover, the study examined the moderating role of individual differences in reactance in the relationship between perceived spatial confinement and variety seeking.

Reactance Theory and Advertising. Some advertising studies have adopted the concept of psychological reactance to explain the detrimental effect of forced or intrusive ad execution (e.g., pop-up ads). As content and ads co-exist in an online environment, individuals are typically exposed to their goal-oriented primary content (e.g., news article, online video) and unwanted ads at the same time (Dreze and Hussherr 2003). Thus, people in an online environment are more likely to perceive a higher level of intrusiveness in ads, leading to a higher level of psychological

reactance. For instance, Edwards et al. (2002) found that when ads were inserted in the middle of a web browsing session, audiences were more likely to perceive goal impediment, leading to a higher level of ad avoidance. The study compared ads that interrupted page content and ads inserted between pages. Given evidence that people tried to avoid the ad in reactance to forced exposure, this study suggested that a higher level of informativeness, entertainment, and congruence between primary content and ads might alleviate consumer irritation. In the context of personalized advertising, Baek and Morimoto (2012) showed that consumers might respond negatively, as a result of reactance, to ad messages that included too much personal information because their perceived ability to control their personal information felt threatened. The next chapter will discuss the effects of user control on reducing psychological reactance.

Effects of Control

The concept of freedom has been defined as the ability and awareness of the ability to engage in a particular behavior (Brehm and Brehm 1981). Rotter (1966) suggested that the concept of control could also be characterized in terms of expectancy rather than determined soley by actual situations. According to his view, people can have different levels of general belief in their locus of control. Some individuals generally expect that they will have control over their lives (internal control), while others believe that their lives are controlled more by the environment (external control). In general, people who perceive high internal control show stronger resistance to external influence than those who perceive high external control. Perceived control has also been studied as a psychological construct that is positively related to physical and mental health (Skinner, 1996; Steptoe and Appels, 1989; Affleck, Tennen, Pfeiffer, and Fifield 1987). Therefore, perceived lack of control could cause not only mental disorder but also physical illness (Peterson and Seligman 1984; Seeman and Lewis, 1995; Everson et al., 1996).

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In the context of individual response to approaching negative stimuli, Averill (1973) defined the concept of control in terms of cognition rather than belief or expectancy. Averill distinguished three kinds of control: behavioral, cognitive, and decisional. Behavioral control is the ability to alter or avoid an impending negative stimulus. Cognitive control is the ability to obtain information about an impending negative stimulus. Decisional control refers to the ability to take alternative courses of action. Each type of control is compatible with the concept of freedom in psychological reactance theory. However, the primary purpose of reactance theory is to understand the antecedents and consequences of a perceived loss of control, while Averill's interest was how the presence of control affected the perception of negative stimuli.

Numerous studies have investigated the effect of control on aversive stimuli (Bowers, 1965; Glass and Singer 1972; Houston 1972; Mandler 1972; Schulz 1976; Sherrod 1974; Hokanson, DeGood, Forrest, and Brittain 1971). Perceived control over stressful events can alleviate anxiety, restrain the activation of threat-related brain processes, and subsequently improve both physical and mental health outcomes (Maier, Amat, Baratta, and Watkins 2006; Sharot, Shiner, and Dolan 2010; Thompson and Schlehofer 2008). Moreover, individuals who considered the occurrence of aversive events controllable exhibited lower autonomic arousal and less performance impairment than those who assumed the occurrence was uncontrollable, even though the chance that the aversive events would occur was the same for both groups (Geer, Davison, and Gatchel 1970; Glass et al.1973). These findings are closely related to the way perceived control can affects psychological reactance to forced ad exposure. That is, giving consumers actual and perceived control over ad exposure should help viewers secure the sense of freedom threatened by an ad interruption and, therefore, reduce reactance and lower the level of

stress. In other words, the ability to reestablish freedom should minimize negative responses to the online video ad.

Motivation for Control

Many psychological theorists have suggested that individuals are motivated to control the incidents in their lives (Adler 1930; Brehm 1966; Kelly 1955; White 1959; DeCharms 1968; Glass and Singer 1972). Adler (1930) found that striving for superiority over life events (e.g., challenging tasks or stronger people) was a primary motivation for achieving control. This motivation has been known to arise from childhood feelings of inferiority. In contrast, Kelley (1955) argued that people prefer to have control in order to understand the world better and effectively predict the outcome of incidents. Similarly, White (1959) proposed that human beings inherently pursue the feeling of competence as a reward for exerting control over their environment. DeCharms (1968) has posited that people strive to be, through their own behavior, the origin of change in their environment. Brehm (1966) emphasized individual effort to regain personal control when one encounters situations that prohibit control over events. Supporting this theory, Glass and Singer (1972) demonstrated that a lack of perceived control resulted in increased frustration and decreased performance.

While people generally are motivated to exert control over their lives, the level of motivation to do so varies. For example, some people like to tell others what to do, change their environment, and work on challenging tasks while others like to follow the decisions of others, adjust to their environment, and avoid problems. Burger (1992) defined desire for control (DFC) as "the extent to which people generally are motivated to see themselves in control of the events in their lives" (p. 226). Although the preference to exercise control varies across situations, Burger claimed that each individual has a certain level of DFC, a personality trait that can be

measured using the Desirability of Control Scale (Burger and Cooper 1979). The twenty items on the scale measure multiple dimensions of control (e.g., having control over one's own decisions, having control over the decisions of others, ensuring that situations do not get out of hand, avoiding situations in which others have control). In short, individuals who are high in DFC are characterized as decisive, assertive, and active, while individuals low in DFC are characterized as indecisive, nonassertive, and passive. Interestingly, Smith et al. (1988) found relationships between DFC and several demographic variables. For example, men were more likely to have high DFC than women, and people with higher levels of education tended to have a higher DFC than those with lower levels of education (Smith et al., 1984, 1988).

Control over Digital Information

The cloud is a massive network of linked content that users can freely navigate, while traditional media (e.g., television programming) presents video content in a linear fashion, giving audiences much less control (Liu and Shrum 2002). Accordingly, online environments are more likely to grant users more freedom to avoid advertising. Users can easily ignore banner ads because they are typically presented alongside primary web content. Pop-up ads are designed to interrupt online activity, but users still have the option either to hide the ad or click the ad for more information. Even when people receive unsolicited newsletters via email, they can choose to read them, delete them, or unsubscribe. Online video advertising has also evolved and is now equipped with various control features that are not available in traditional media. In 2010, YouTube introduced the TrueView online video ad format, which allows users to skip directly to the target video after the first five seconds of an ad. In this way, users can choose to move on to primary video content more quickly or continue viewing an ad that interests them. YouTube in-stream video ads also enable advertisers to embed links in their ads so that viewers can choose to

take immediate action. Another example is Hulu's Ad Swap, which offers users some control over the types of products that will be promoting in the ad they see. For instance, a Hulu user might be asked to choose between an ad promoting a restaurant and an ad promoting a car. Online video ads also now often display the time remaining before the primary content will return, a countdown of sorts, in order to alleviate feelings of uncertainty while watching an ad. Because consumers tend to overestimate the time that expires when they are forced to wait, displaying the remaining time of a commercial break might contribute to the perception of being in control even when they cannot speed up the ad. Furthermore, based on behavioral data available online, advertisers might be able to create the feeling of being in control by providing ads that are more relevant to the primary content.

Brand websites are a powerful advertising media because they are full of product and brand information. When visiting a brand website, users have control over which content to watch or read and for how long. Indeed, the concept of user control over digital information has been well defined and operationalized in various website interactivity studies. Many scholars who have examined the concept of website interactivity recognized its multidimensional nature (Song and Zinkhan 2008; Liu 2003). Although these studies use different terminology, three primary dimensions have emerged: two-way communication, responsiveness, and control. Twoway communication refers to the capacity for mutual communication between two entities (e.g., feedback and transactions). Responsiveness refers to the speed of response or feedback in communication. Control refers to the degree to which users can determine their interaction with digital information (e.g., content, display order, and display time).

Teo et al. (2002) examined how the level of website interactivity influenced user attitudes toward the website. Three different levels of website interactivity were empirically compared.

The low-interactivity condition provided a website with plain product information; participants could only control how quickly and in what order they processed information (i.e., pace and sequence). In addition to product information, the medium-interactivity condition provided FAQs, a feedback form, and a search engine. The high-interactivity condition contained all of the features of the medium-interactivity condition, plus an online guestbook, an online forum, and an online chat tool. Findings indicate that higher levels of interactivity led to more positive effects on overall attitude toward the website (i.e., perceived satisfaction, efficiency, effectiveness, and value). In the context of web shopping, Jee and Lee (2002) identified Need for Cognition (NFC) and Internet skills as significant predictors of perceived website interactivity and attitude toward the site as a consequence of perceived website interactivity. Sundar, Kalyanaraman, and Brown (2003) investigated the effect of interactivity in the context of political websites for a fictitious political candidate. The low-interactive website did not contain any hyperlinks. The mediuminteractivity website had four hyperlinks to main policy issue pages. The high-interactivity website added three hyperlinks to sub-issue pages on each main issue page. The results show that the level of website interactivity significantly influenced visitors' impressions of the personal attributes of the candidate and even their level of agreement with his position on a specific policy. In particular, they found that a moderate level of interactivity was more effective than a high level of interactivity in the context of political websites. This result implies that excessive interactivity might impose greater demands on users and undermine the otherwise positive effects of engagement through interactivity. In the context of online shopping, Ariely (2000) found that having control over which information to access led people to remember and understand product information better. Bezjian-Avery, Calder, and Iacobucci (1998), on the other hand, found a negative effect of control. In their study, interactive ads in which participants could click links to additional information resulted in less viewing time and purchase intention than linear ads similar to TV commercials. Coyle and Thorson (2001) also demonstrated that high user control manipulated by increasing the number of links on a website did not influence user attitude toward the website. These conflicting findings on the effects of control could have several possible explanations. First, different ways of manipulating user control might produce different effects. For example, some studies manipulated user control by varying the number of choices (Sundar et al. 2003; Bezjian-Avery et al. 1998); other studies differentiated the way users navigate information (Teo et al. 2002; Ariely 2000). Second, the effect of control might depend on individual traits or situational context. Ariely (2000) observed that the effect of control disappeared when a difficult or novel task was given. Sicilia, Ruiz, and Munuera (2005) confirmed that NFC moderated the effect of interactivity; its effect on the level of information processing was greater for low-NFC individuals, while its effect on flow state intensity was greater for high-NFC individuals. Third, increasing the number of control features does not guarantee an increase in perceived control.

Actual vs. Perceived Control

In digital media, actual controllability refers to control given to users by the technological features of a media tool. Therefore, actual controllability can be assessed by observing the number or type of controllability features. On the other hand, perceived controllability refers to the subjective experience of having control over a media experience. Perceived control can be measured by self-reported feelings experienced by a user. Interactivity studies have largely held two different points of view on controllability (i.e., interactivity). Some studies have claimed that the concept of interactivity should be studied as an actual feature of a medium, while others have argued that perceived interactivity affects user response more than actual interactivity. Either

way, the relationship between actual controllability and perceived controllability is crucial to understanding the construct of controllability.

The majority of interactivity studies have shown a positive linear relationship between actual interactivity and perceived interactivity. That is, higher interactivity or more interactivity features led to stronger perceptions of interactivity. On the other hand, some studies have found that the relationship between actual and perceive interactivity was not linear. McMillan (2002) first problematized the unclear relationship between objectively established interactivity and subjectively measured interactivity. She conducted an exploratory content analysis on 108 health-related websites and found no significant correlation between the number of actual interactivity features on the websites and user-perceived interactivity. Similarly, in Lee et al. (2004), participants perceived significantly different levels of interactivity even when exposed to websites with the same number of interactivity features. In addition, Song and Zinkhan (2008) investigated the effects of three interactivity features (i.e., number of clicks, response time, and message type) of a website on perceived interactivity. Findings suggest that whether the message was personalized was a stronger predictor of perceived interactivity than response time and number of clicks. Moreover, they found that the effect of actual interactivity was greater for consumers who complained (vs. inquired) on the website. They concluded that increasing the number of interactivity features does not guarantee an increase in perceived interactivity.

Previous studies indicate several reasons why the relationship between actual interactivity and perceived interactivity is not always linear. First of all, the level of perceived interactivity might vary across interactivity features. In other words, one interactivity feature might not share the same level of perceived interactivity with another feature. An alternative explanation is that people might not recognize interactivity now that some interactivity features have become so common (e.g., hyperlinks or breadcrumbs on a website). Yun (2007) hypothesized that only unique interactivity features would influence user perception of interactivity. In a similar vein, Sohn, Ci, and Lee (2007) demonstrated that user expectations about interactivity features moderated the effect of actual interactivity on perceived interactivity. Voorveld, Neijens, and Smit (2011) found incongruence between actual and perceived interactivity by conducting a content analysis of interactivity features on websites of the top 100 global brands and a survey that measured the interactivity perception of users while visiting those websites. They confirmed that only the most novel or unexpected interactive features contributed to perceived interactivity. Therefore, it is important to distinguish actual controllability and perceived controllability when the study investigates the construct of controllability.

The current study focuses on how digital ad control features affect the level of perceived control over the ads, in turn influence the psychological reactance to the ads and attitudinal responses to the ads eventually (see Figure 1). The next chapter will walk through the development of study hypotheses and discuss the theoretical underpinning.



Figure 1. Conceptual Framework

CHAPTER 3

HYPOTHESES

Although online video advertising is an effective communication tool, users often considered it intrusive (McCoy et al. 2008; Cho and Cheon 2004; Li et al. 2002), especially when an ad interrupts the flow of primary video content (Ha 1996; Li and Lo 2015). This interference could be perceived by users as a threat to the freedom to engage in the media content they want (Brehm and Brehm 1981). In psychological reactance to this threat, individuals might perceive intrusiveness (i.e., cognitive outcome) and/or feel irritated (i.e., affective outcome) (Li et al., 2002; Edwards et al., 2002; Ritter and Cho 2009). Furthermore, ad intrusiveness and ad irritation have been known to affect advertising outcomes negatively (Aaker and Bruzzone 1985; Ritter and Cho 2009; Li et al. 2002). Because psychological reactance is a motivational state that inspires individuals to secure and maintain their sense of freedom, removing the perceived threat could minimize the damaging consequences of online video ads.

The current study posited that increasing perceived control over ad viewing might help individuals restore their sense of freedom and lower the chance of a negative ad reaction. Numerous studies have confirmed that perception of being in control alleviated reactance toward stressful events and improved mental and physical condition (Maier et al. 2006; Sharot et al. 2010; Thompson and Schlehofer 2008). In the context of website browsing, the level of perceived control was positively related to perceived interactivity, attitude toward the website, and ability to recall information from the website (Teo et al. 2002; Sundar et al. 2003; Ariely 2000). These findings indicate that giving consumers some impression of control over viewing an in-stream video ad should help them restore their sense of freedom, lead them to perceive the experience as less stressful, and reduce their negative responses to the ad. In particular, the current study examined the effect of behavioral and cognitive ad control features on the level of perceived control, psychological reactance, and subsequent advertising outcomes.

Effects of Ad Skip Option

A behavioral control feature frequently available in online video advertising is the option to skip an ad. Previous studies have shown that a skip option can influence perceived control and psychological reactance to ads. McCoy et al. (2008) revealed that control over an ad that is obscuring site content alleviated the experience of interruption. This result is consistent with psychological reactance theory, which predicts that an individual will act to restore lost or impaired freedom. A study of Pashkevich et al. (2012) also confirmed that skippable online video ads were more effective in reducing the negative impact of forced exposure to advertising than traditional non-skippable online video ads. The study also found that Internet users strongly preferred skippable online video ads. Indeed, in the context of forced exposure to online video advertising, viewers are likely to regain a sense of freedom using an available skip option. The current study investigated how skip option availability might influence perceived control over advertising. The researcher proposed that skip option availability would enhance the perception of control over ad exposure. According to psychological reactance theory, perceived control should help consumers feel free to continue enjoying their media content in the face of a perceive threat to that freedom (i.e., interrupting ad). Thus, an online video ad with a skip option should reduce both cognitive (i.e., ad intrusiveness) and affective (i.e., ad irritation) reactance. Because feelings of annoyance and intrusiveness are negatively related to advertising outcomes (Goodrich et al. 2015; Speck and Elliott 1997; Rettie 2001; MacKenzie and Luts 1989), reduced cognitive

and affective reactance should lead to more favorable attitude toward the ad (A_{ad}) and attitude toward the brand (A_b) . Thus, an online video ad with a skip option should demonstrate better advertising outcomes than the one without a skip option. The following hypotheses were proposed:

- **H1a:** An online video ad with a skip option will lead to a higher level of perceived control than an online video ad without a skip option.
- **H1b:** An online video ad with a skip option will lead to a lower level of ad intrusiveness than an online video ad without a skip option.
- **H1c:** An online video ad with a skip option will lead to a lower level of ad irritation than an online video ad without a skip option.
- H1d: An online video ad with a skip option will lead to more favorable A_{ad} than an online video ad without a skip option.
- H1e: An online video ad with a skip option will lead to more favorable A_b than an online video ad without a skip option.

In addition to the proposed relationships above, an ad with a skip option is more likely to lead to shorter ad exposure time than an ad without a skip option. Whereas an online video ad without a skip option forces viewers to watch an entire ad, an ad with a skip option allows viewers to return to primary video content sooner. Previous studies about forced exposure have shown that longer ads lead to greater brand memory (Allan 2007) and a higher level of ad recognition but also stronger psychological reactance (McCoy et al. 2008) than shorter ads. Therefore, the availability of an ad skip option might help reduce cognitive and affective reactance due to shorter ad exposure. The effect of ad exposure time on ad intrusiveness and irritation is difficult to predict. For example, if a viewer does not like an ad from the beginning, shorter exposure time might reduce psychological reactance (i.e., irritation). If the viewer dislikes the ad but is forced to watch it or wait for it to end, long exposure time might increase psychological reactance. When ad exposure is voluntarily long, the viewer is likely to be highly engaged with the ad he or she is enjoying. However, when ad exposure is forced, knowing whether exposure time positively or negatively influences psychological reactance is impossible. Therefore, examining the extent to which exposure time, given the presence of an ad skip option, might result in ad intrusiveness and irritation is important. Because the prediction is not necessarily unidirectional, the following research question was posed to examine whether ad exposure time mediated the effect of an ad skip option on ad intrusiveness and irritation.

RQ1: Does ad exposure time mediate the effect of an ad skip option on (a) ad intrusiveness and (b) ad irritation?

Effects of Ad Time Display

Online in-stream video ads are likely to be seen as unwelcome interruptions (McCoy et al. 2008; Cho and Cheon 2004; Li et al. 2002). When viewers encounter ads, they first attempt to estimate the length of the ad and cognitively compare that estimation with their tolerance level (Yu et al. 2012). If the estimated length of the ad is beyond their tolerance, viewers might develop negative A_{ad} and even abandon the content and ad altogether (Goodrich 2015; Danaher 1995; Van Meurs 1998). However, estimation of ad length tends to be subjective and is often inaccurate (Lockhart 1967; Schiff and Thayer 1968; Triesman 1963). Without a time display, the estimate will be based on heuristics (e.g., prior experiences), and the uncertainty is likely to lead to cognitive bias (Kevin et al. 2007; König 2005). Some viewers overestimate the length of the ad, and some underestimate it. If a time display is provided, on the other hand, viewers can make more informed cognitive comparisons using the actual duration of an ad instead of an estimation
(Yu et al. 2012). Averill (1973) found that the acquisition and appraisal of information (e.g., time frame) about an impending noxious stimulus increased cognitive control. While being forced to wait for an online video ad to finish, ad duration could help viewers form subsequent attitudes and/or determine subsequent behaviors. Thus, the current study predicted that the presence of a time display would significantly increase the level of perceived control, reduce psychological reactance, and increase subsequent advertising outcomes. The following hypotheses were proposed:

- **H2a:** An online video ad with a time display will lead to a higher level of perceived control than an online video ad without a time display.
- **H2b:** An online video ad with a time display will lead to a lower level of ad intrusiveness than an online video ad without a time display.
- **H2c:** An online video ad with a time display will lead to a lower level of ad irritation than an online video ad without a time display.
- H2d: An online video ad with a time display will lead to more favorable A_{ad} than an online video ad without a time display.
- H2e: An online video ad with a time display will lead to more favorable A_b than an online video ad without a time display.

The Interaction between Ad Skip Option and Ad Time Display

The current study predicted that the effect of a time display (i.e., cognitive control) would be moderated by the presence of a skip option (i.e., behavioral control). Behavioral control is directly related to one's ability to alter or avoid impending negative stimuli (Averill 1973). Therefore, when individuals can avoid viewing ads they do not want to see, they have little reason to assess the negative impact of forced ad exposure. On the other hand, when individuals have no option to skip an ad, they will struggle to obtain and assess information related to ad exposure in order to estimate the consequences of the event. In sum, the effect of cognitive control should be more prevalent when viewers do not have behavioral control than when they perceive the presence of behavioral control. The following hypotheses were proposed:

- **H3a:** The increase in perceived control due to a remaining ad time display will be greater when an ad skip option is unavailable than when it is available.
- **H3b:** The decrease in ad intrusiveness due to a remaining ad time display will be greater when an ad skip option is unavailable than when it is available.
- **H3c:** The decrease in ad irritation due to a remaining ad time display will be greater when an ad skip option is unavailable than when it is available.
- H3d: The increase in A_{ad} due to a remaining ad time display will be greater when an ad skip option is unavailable than when it is available.
- **H3e:** The increase in A_b due to a remaining ad time display will be greater when an ad skip option is unavailable than when it is available.

Ad exposure time is also likely to mediate the interaction effect of an ad skip option and an ad time display on ad reactance. The study hypothesized that the effect of an ad time display on ad reactance would be greater without an ad skip option because the forced ad exposure would be unavoidable. However, it is also plausible that the effect of an ad time display on reactance is weaker with an ad skip option due to an actual difference in ad exposure time instead of perceived control. To explore the underlying mechanism of the interaction effects of an ad skip option and an ad time display on reactance to forced ad exposure, the following research question was asked:

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RQ2: Does ad exposure time mediate the interaction effect of an ad skip option and an ad time display on (a) ad intrusiveness and (b) ad irritation?

The Mediating Role of Perceived control

According to the literature, actual control should be distinguished from perceived control. It has been known that actual control does not produce its effect when individual does not realize they have control over the stimuli (Smit 2011; McMillan (2002). Therefore, advertising control features influence individual's reactance to the ad through individual's perception of having control. Thus, the following hypotheses were proposed:

- H4: Perceived control will mediate the effect of an ad skip option on (a) ad intrusiveness and (b) ad irritation.
- H5: Perceived control will mediate the effect of a time display on (a) ad intrusiveness and (b) ad irritation.

The Mediating Role of Reactance

The effect of perceived control on advertising outcomes will be mediated by the individual's perceived reactance toward the ads. Perception of having control over forced viewing of advertisement would lead consumers to perceive a higher chance of restoring their freedom that was threatened by an ad, resulting in less intrusiveness and irritation. Further, reduced intrusiveness and irritation would influence subsequent advertising outcomes favorably. That means the increased advertising outcome would be the result of reduced reactance rather than the direct impact of increased perceived control. Thus, the following hypotheses were proposed:

H6: Ad intrusiveness will mediate the effect of perceived control on A_{ad}.

H7: Ad irritation will mediate the effect of perceived control on A_{ad}.

Advertising literature has confirmed that individual's positive attitude toward the advertisement (A_{ad}) is likely to transferred to one's attitude toward the advertised brand (A_b) (Mackenzie and Lutz 1989; Gardner 1985; Brown and Stayman 1992; Homer 1990). *Relationship between Ad intrusiveness and Irritation.* Previous research has revealed that interrupting individuals from reaching their goals results in the feeling of irritation (Aaker and Bruzzone 1985; Edwards et al. 2002). McCoy et al. (2008) also found that internet users showed irritation when they found the advertisement as intrusive. Thus, the following hypothesis was proposed:

H8: Ad intrusiveness will positively influence ad irritation.

The Moderating Role of Desire for Control (DFC)

The impact of perceived control may vary depending on individual's desire for control. Rather, perceived control will be most efficacious when individuals are motivated to maintain personal control (Wallston et al. 1991). Even though the need for personal control appears to be grounded in biological advantage, the preference to be in control or to exert control varies both chronically (Burger and Cooper 1979) and by situation (Pittman and Pittman 1980). Previous studies have indicated that the benefits of personal control were greatest when the motivation for control is high and the individual recognized a direct connection between action and a desired outcome (Sartory, Heinen, Pundt, and Johren 2006; Sprott, Brumbaugh, and Miyazaki 2001; Thompson and Schlehofer 2008). Therefore, the current study predicted that DFC would increase the benefits of perceived control:

H9: The effect of perceived control on (a) ad intrusiveness and (b) ad irritation will be greater for individuals with a higher level of DFC than those with a lower level of DFC.

Based on the previous discussion, the proposed research model is presented in Figure 2.



Figure 2. Proposed Research Model

CHAPTER 4

METHOD

Overview and Design

The main purpose of the current study was to examine the effect of an ad skip option and a remaining ad time display on perceived control over advertising, psychological reactance, and subsequent advertising outcomes of Internet users. Also, this study investigated the mediating role of perceived control in the relationship between actual control features (skip option and time display) and psychological reactance. To test the proposed hypotheses, a 2 (Skip option: skippable vs. non-skippable) \times 2 (Time display: presence vs. absence) between-subjects experiment was conducted online. Subjects were recruited from Qualtrics, a research sampling company, and randomly assigned to one of the four experimental conditions.

Experimental Stimuli

For the experiment, brief scenarios presented through online articles were devised to set the stage for participants to experience a realistic video-watching situation. One of the most frequently mentioned reasons to search online videos is to learn how to solve a specific task (Gesenhues 2015). Accordingly, participants were asked to choose one out of five pre-selected topics that they were interested in learning something useful about: housework, cooking, driving, technology, and exercise. Participants were asked to choose a topic from a pool of alternatives to simulate an online environment in which they have some control over content. The five topics all reflected tasks common in everyday life (Gesenhues 2015). Based on their choice, participants were asked to read a brief article to enhance their interest in a specific topic and develop a goaloriented mindset, just as they would in an online environment (see Appendix). For example, participants who choose cooking read a brief article about peeling garlic: "In your kitchen, garlic is as valuable as a sharp knife. Garlic is used in sauces, dips, pastas, chicken dishes, and seafood—you name it! Garlic is such a flavorful and healthy ingredient, you can use it to cook many meals. However, peeling can be tedious and take up valuable cooking time if you don't know the right tricks. Check out this video showing you how to peel garlic efficiently." After reading an article, participants were directed to the video referenced in the article.

To select appropriate video contents and an advertisement as experimental stimuli, a pretest was conducted with a total of 113 participants recruited from Amazon Mechanical Turk (see Table 1 for sample composition).

	Pretest
Sample N	113
Mean age	34.45 (11.50)
Gender (%)	
Male	57.5
Female	42.5
Ethnicity (%)	
Caucasian/White	69.9
Black American	11.5
Asian American	7.1
Latino/Hispanic	8
Multiracial	1.8
Others (i.e., Pacific Islander, Native	1.8
American)	1.0

Table 1. Pretest: Sample Composition

Note. Values in parentheses indicate standardized deviation.

For the video content stimuli, five "how-to" videos were selected from a YouTube channel: "how to unshrink your clothes," "how to extend your phone's battery life," "how to peel garlic efficiently," "how to do leg workouts," and "how to jump-start a car." Because the primary interest of the study was to observe the effect of a skip option and time display embedded in an in-stream ad, the general qualities of the five videos had to be consistent to prevent confounding effects. The length of each video was one minute, and a pretest was conducted to determine whether the five videos shared five criteria; likability, enjoyment, informativeness, pre-exposure, and engagement. Participants were randomly assigned to one of the five videos and indicated his or her opinion of the video on the five criteria. The results of a one-way ANOVA showed that the five videos were not significantly different from each other (see Table 2).

Video Type					Pre-
(How to)	Engagement	Usefulness	Enjoyment	Attitude	exposure
Peel garlic	5.86 (1.04)	5.95 (1.36)	5.77 (1.19)	6.14 (1.13)	0%
Do leg workout	5.76 (1.18)	6.38 (.80)	5.62 (1.12)	6.21 (.87)	0%
Extend a battery life	5.89 (1.05)	6.16 (.83)	5.95 (.91)	6.20 (88)	0%
Unshrink a shirt	6.09 (.97)	6.41 (.80)	6.99 (.98)	6.40 (.77)	0%
Jump start a car	5.75 (1.45)	6.50 (.83)	5.30 (1.53)	5.95(1.15)	1.70%
F value	.31 (NS)	1.14 (NS)	1.20 (NS)	.55 (NS)	N/A

Table 2. Pretest: Video S

Note. NS indicates p > .05

Tukey HSD post hoc test showed no significant differences among videos on measures of Engagement, Usefulness, Enjoyment and Attitude.

For the advertising stimulus, a common product category (i.e., drink) was selected for several reasons. First, the study was interested in general U.S. consumers, and drink product has been one of the most frequently purchased products based on MRI data. Because online video ads appear based on user interest and purchase history, being exposed to an ad for a completely unrelated product (e.g., retirement plan ad for college students) would be unrealistic. To avoid potential confounding effects, this study used unknown brands for the experiment. Based on interviews with 10 graduate students, five unfamiliar drink brands were identified; Dilmah iced

tea, Real iced tea, Zero Propel water, Ice Mountain water, and Innocent orange juice. In order to find a brand with a low level of familiarity and neutral levels of likeability, category benefit, and implied quality, a total of 113 participants also evaluated ads from the five identified brands. The results of the pretest indicate that Innocent orange juice was the most appropriate stimuli (see Table 3).

Advertisement	Familiarity	Aad	Ab
Innocent Orange Juice*	1.68 (1.01)	5.12 (.92)	5.22 (1.25)
Dilmah Iced Tea	2.07 (1.98)	6.39 (.88)	6.22 (1.12)
Real Iced Tea	2.85 (1.80)	5.50 (1.17)	5.47 (1.21)
Ice Mountain Water	3.00 (1.93)	5.99 (1.00)	5.70 (1.10)
Propel Water	4.96 (1.66)	4.70 (1.41)	4.70 (1.47)

Table 3. Pretest: Ad Selection

Note: * indicated the selected ad

Because the primary purpose of the study was to examine how user control over advertising might reduce reactance from forced ad exposure, the ad was embedded in the middle each the "how-to" video, rather than before or after the video, in order to maximize initial reactance to the ad. The length of the video ad was set at 30 seconds because most online video ads range from 15 to 30 seconds (idomoo 2016).

Because the study used a 2 (Skip option: skippable vs. non-skippable) \times 2 (Time display: presence vs. absence) between-subjects design, two independent variables were manipulated. The skip option variable was manipulated by the presence or absence of an ad skip option in the embedded video ads. In the skippable ad condition, a skip button with the message "Skip Ad" appeared in the right-bottom corner of the ad. In the non-skippable ad condition, participants had no option to skip the ad and had to watch the entire ad before returning to the primary video content. Meanwhile, the time display variable was manipulated by the presence or absence of time information related to ad exposure. In the presence condition, a timer counting down during the ad (from 30 seconds to 1 second) was displayed in the bottom left corner. In addition, when the skip option was available, the remaining time before ad could be skipped (from 5 seconds to 1 second) was also displayed. In the absence condition, no time information was displayed in the ad. Any other control options typically available in an online video player, including a control bar, a fast-forward button, a re-wind button, or hyperlinks, were eliminated in order to control for potential confounding effects, and all other features of the ads, including length, speed, information, and screen size, were consistent across the four experimental conditions.

Measurements

Perceived control over the ad. Since the scale specifically measures the perceived control over advertisement has not yet developed in advertising literature, the current study reviewed the interactivity scale (Song and Zinkhan 2008; Liu 2003) and adopted measurement items for 'user control,' which is a sub-dimension of interactivity. Therefore, perceived control over advertisement was measured using a seven-point Likert scale (1 = strongly disagree; 7 = strongly agree) with three items adapted from Song and Zinkhan (2008): (a) "I had control over the ad," (b) "Watching the ad was manageable," and (c) "I had no control over what I could do about the ad on the screen."

Ad intrusiveness. As a cognitive reactance to the ad, ad intrusiveness was measured using a seven-point Likert scale (1 = strongly disagree; 7 = strongly agree) with six items: distracting, disturbing, forced, interfering, intrusive, and invasive (Li et al. 2001).

Ad irritation. As an affective reactance to the ad, ad irritation was measured using a seven-point Likert scale (1 = strongly disagree; 7 = strongly agree) with five items: irritating, phony, ridiculous, stupid, and terrible (Wells, Leavitt, and McConville 1971).

Attitude toward the ad (A_{ad}). A_{ad} was measured using a seven-point semantic differential scale with three items: bad/good, unfavorable/favorable, and dislikable/likable (MacKenzie and Lutz 1989).

Attitude toward the brand (A_b). A_b was also measured using a seven-point semantic differential scale with three items: bad/good, unfavorable/favorable, and negative/positive (MacKenzie and Lutz 1989).

Desire for Control (DFC). General DFC was measured using a seven-point Likert scale (1 = strongly disagree; 7 = strongly agree) with 7 statements adopted from Burger and Cooper's DFC scale (1979), including "I enjoy making my own decisions," "I try to avoid situations where someone else tells me what to do," and "I'd rather run my own business and make my own mistakes than listen to someone else's orders."

Skip behavior. For participants assigned to the skippable ad condition, whether they actually skipped the ad was checked using a yes/no question: "Did you skip the ad?"

Duration of ad exposure. To estimate the duration of ad exposure time, participants who were assigned to the skippable ad condition were asked to indicate the last ad scene they saw from the list of 7 ad scenes; from the scene 1 (5 seconds) to the scene 7 (30 seconds). Participants who were assigned to the non-skippable ad condition were considered to be exposed to the whole 30 seconds of the ad.

Demographics. To analyze demographic characteristics of participants, gender, age, ethnicity, education, and income level was assessed at the end of the questionnaire.

Construct	Measurement Items	Source
	(1=Strongly disagree, 7=Strongly agree)	
	•I had control over the ad	
Dense internal	•Watching the ad was manageable ^K	Song and Zinkhan
over the ad (.71)	• had no control over what I could do about the ad on the screen.	(2008) Liu (2003)
	(1=Strongly disagree, 7=Strongly agree)	
	•Distracting	
	•Disturbing	
	•Forced	
A 1 · / ·	•Interfering	
Ad intrusiveness	•Intrusive	L ₁ , Edwards, and L_{22} (2001)
(.89)	•Invasive	Lee (2001)
	(1=Strongly disagree, 7=Strongly agree)	
	•Irritating	
	•Phony	
	•Ridiculous	
	•Stupid	Wells, Leavitt, and
Ad irritation (.93)	•Terrible	McConville (1971)
	(7-point sementic differential scale)	
	•Bad-Good	
Attitude toward	•Unfavorable-Favorable	MacKenzie and
the ad (Aad) (.94)	•Dislikable-Likable	Lutz (1989)
	(7-point sementic differential scale)	
Attitude toward	•Bad-Good	
the brand	•Unfavorable-Favorable	MacKenzie and
(Ab)(.95)	•Negative/Positive	Lutz (1989)

Table 4. Measurement Items

	(1=Strongly disagree, 7=Strongly agree)	
	 I prefer to avoid situations where someone else has to tell me what it is I should be doing. I enjoy making my own decisions. I enjoy having control over my own destiny. I consider myself to be generally more capable of handling situations than others are. I'd rather run my own business and make my own mistakes than listen to someone else's orders. I try to avoid situations where someone else tells me what to do. 	
Desire for Control	•I prefer to avoid situations where someone else has to	Burger and Cooper
(DFC)(.84)	tell me what it is I should be doing.	(1979)
Note. ^R Indicate an ite	m dropped from analysis due to the reliability issue	

Participants and Procedure

A total of 217 participants were recruited from Qualtrics, a research sampling company (see Table 5 for sample composition). The study was conducted in an online setting. First, subjects were given a brief introduction to the study and were asked to sign a consent form. Then, subjects were asked to pick one topic from the list, which included housework, cooking, driving, technology, and exercise. Based on their choice, participants were shown a brief article introducing a common topic related to their chosen interest (e.g. "Preparing garlic for cooking" for those who picked cooking and "Do not skip leg workouts" for those who picked exercise). The article was used to encourage participants to focus on the topic and want to learn a related skill, rousing the goal-oriented mindset they might have in online media environment. Although the article introduced the need to learn a specific skill, it did not give any instruction. After reading the article, participants were asked to imagine that they had searched and found a oneminute "how-to" video related to the article (e.g., "how to peel garlic efficiently" and "how to do leg workouts quickly"). Then, they were directed to watch the video teaching the task. They were told that they would answer some questions about what they had learned from the video. While they were watching, an in-stream ad was shown, interrupting the video. Subjects were randomly assigned to one of four ad conditions: (a) skip option absence and time display absence, (b) skip option absence and time display presence, (c) skip option presence and time display absence, and (d) skip option presence and time display presence. After the participants finished watching the ad and the rest of the video, they were asked to respond to the questionnaire items. The entire process for each participant took 15-20 minutes.

	Main
	Experiment
Sample N	217
Mean age	32.14 (8.49)
Gender (%)	
Male	51.6
Female	48.4
Ethnicity (%)	
Caucasian/White	71.4
Black American	10.1
Asian American	8.8
Latino/Hispanic	6.5
Multiracial	2.3
Others (i.e., Pacific Islander, Native American)	1.0

Table 5. Main Experiment: Sample Composition

CHAPTER 5

RESULTS

This chapter reports the results of the experiment. A total of seven hypotheses were tested to assess (a) the effects of an ad skip option and time display on consumer ad evaluations, (b) the mediating role of perceived control over the ad, ad intrusiveness, and ad irritation, and (c) the moderating role of desire for control. To test the proposed hypotheses, a 2 (Skip option: presence vs. absence) \times 2 (Time display: presence vs. absence) Multivariate Analysis of Variance (MANOVA; H1, H2, and H3) and a Structural Equation Modeling (SEM) (H4 – H10) were conducted.

Hypotheses Testing: H1, H2, and H3

The main effects of a skip option and time display and the interaction effect were analyzed using MANOVA for the following reasons. First, the current study examined the effect of independent variables on five dependent variables (i.e., perceived control over the ad, ad intrusiveness, ad irritation, A_{ad}, and A_b), and previous studies have shown that they are closely related to each other (Edward et al. 2002; McCoy et al. 2008). Second, MANOVA detects not only overall differences but also the combined differences that would otherwise not be apparent. Third, MANOVA can control the experiment-wide error rate and reduce the probability of a Type I error because some degree of correlation among the dependent variables exists. For MANOVA procedures to be valid, three assumptions must be met. First, the observations must be independent. The current study maintained independence of observation using an experimental setting, and subjects were recruited from across the country, minimizing potential relationships among them. Second, the equivalence of covariance matrices across the groups must be achieved. The roughly equal sample sizes among the groups secured the equivalence of covariance matrices. Therefore, the MANOVA procedure was considered acceptable.

The Effects of a Skip Option. Before examining the main effects of the skip option on dependent variables respectively, a multivariate test was conducted to assess the effects collectively. Table 6 summarizes the outputs from the 2 (Skip option: presence vs. absence) × 2 (Time display: presence vs. absence) MANOVA. The results of the MANOVA (Wilks' Lamda = .95, F = 30.59, p < .05) indicate a significant effect of the skip option; that is, all of the dependent variables (i.e., perceived control, ad intrusiveness, ad irritation, A_{ad}, and A_b) collectively varied with the presence or absence of the skip option.

Given the significance of the multivariate test, the results of the univariate tests (within MANOVA) were reviewed to examine the effect of the skip option on each dependent variable. The results indicate a significant effect of the skip option on perceived control (F(1, 213) = 146.21, p < .05), ad intrusiveness (F(1, 213) = 14.04, p < .05), and ad irritation (F(1, 213) = 8.87, p < .05). In particular, subjects in the skippable ad condition perceived greater control over the ad ($M_{perceived_control} = 5.23, SD = 1.40$), perceived less intrusiveness of the ad ($M_{ad_intrusiveness} = 4.09, SD = 1.10$), and felt less irritation toward the ad ($M_{ad_irritation} = 3.11, SD = 1.45$) than subjects in the non-skippable ad condition ($M_{perceived_control} = 2.82, SD = 1.56; M_{ad_intrusiveness} = 4.67, SD = 1.22; M_{ad_irritation} = 3.42, SD = 1.62$). However, the effects of the skip option on A_{ad} ($M_{skip} = 5.03, SD = 1.39$ vs. $M_{no_skip} = 4.72, SD = 1.54, F(1, 213) = 2.43, p > .05$) and A_b ($M_{skip} = 5.17, SD = 1.33$ vs. $M_{no_skip} = 4.87, SD = 1.47, F(1, 213) = .48, p > .05$) were not significant (see Table 7). Thus, the results supported H1a, H1b, and H1c, but not H1d or H1e.

IVs	Dependent Variables	df	Mean Square	F	Sig.
Skip Option	Perceived Control	1	314.83	146.21	.00***
	Ad Intrusiveness	1	18.63	14.04	.00***
	Ad Irritation	1	22.07	8.87	.00***
	Aad	1	5.14	2.43	.12
	Ab	1	.93	.48	.49
Time Display	Perceived Control	1	11.88	5.52	.02*
	Ad Intrusiveness	1	6.45	4.86	.03*
	Ad Irritation	1	12.55	5.04	.03*
	Aad	1	6.48	3.07	.08
	Ab	1	4.31	2.23	.14
Skip Option x Time Display	Perceived Control	1	1.42	.66	.42
	Ad Intrusiveness	1	2.06	1.55	.22
	Ad Irritation	1	2.78	1.12	.29
	Aad	1	6.08	2.88	.09
	Ab	1	.43	.22	.64
Error	Perceived Control	213	2.15		
	Ad Intrusiveness	213	1.33		
	Ad Irritation	213	2.49		
	Aad	213	2.11		
	Ab	213	1.93		

Table 6. Results of Multivariate Analysis of Variance (MANOVA)

Note. Statistically significant at *<.05, **<.01, or ****p*<.001

Tab	le 7.	The	Main	Effect	of	Skip	Opt	ion	(Mean)
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	Perceived	Ad			
	Control	Intrusiveness	Ad Irritation	Aad	Ab
Skippable	5.23 (1.40)	4.09 (1.10)	3.11 (1.45)	5.03 (1.39)	5.17 (1.33)
Non Skippable	2.82 (1.56)	4.67 (1.22)	3.42 (1.62)	4.72 (1.54)	4.87 (1.47)
F Value	146.21***	14.04***	8.87**	2.43	0.48

Note. Values in parentheses indicate standardized deviation. Statistically significant at *<.05

To answer RQ1, the study further investigated whether ad exposure time mediated the effects of an ad skip option on ad intrusiveness and ad irritation using the PROCESS macro (Hayes 2012). A significant direct effect of an ad skip option on ad intrusiveness emerged (b = -1.06, p < .01); however, the indirect effect of an ad skip option on ad intrusiveness via ad exposure time was not significant (b = .31, p > .05). Moreover, a significant direct effect of an ad skip option on ad irritation emerged (b = -.99, p < .01); however, the indirect effect of an ad skip option on ad irritation emerged (b = -.99, p < .01); however, the indirect effect of an ad skip option on ad irritation emerged (b = -.99, p < .01); however, the indirect effect of an ad skip option on ad irritation via ad exposure time was not significant (b = .35, p > .05). The results show that ad exposure time did not mediate the effect of an ad skip option on reactance.

The Effects of a Time Display. The results of the MANOVA (Wilks' Lamda = .95, F = 2.38, p < .05) also indicate a significant effect of the time display. Given the significance of the multivariate test, the results of the univariate tests (within MANOVA) were reviewed to examine the effect of the time display on each dependent variable. The results indicate a significant effect of the time display on perceived control (F(1, 213) = 5.52, p < .05), ad intrusiveness (F(1, 213) = 4.86, p < .05), and ad irritation (F(1, 213) = 5.04, p < .05). In particular, subjects in the time display condition perceived greater control over the ad ($M_{perceived_control} = 4.25, SD = 1.87$), perceived less intrusiveness of the ad ($M_{ad_intrusiveness} = 4.20, SD = 1.16$), and felt less irritation toward the ad ($M_{felt_irritation} = 3.19, SD = 1.56$) than those in the no time display ad condition ($M_{perceived_control} = 3.82, SD = 1.93; M_{perceived_intrusiveness} = 4.54, SD = 1.22; M_{felt_irritation} = 3.66, SD = 1.65$). However, the effect of the time display on A_{ad} ($M_{time} = 5.05, SD = 1.44$ vs. $M_{no_time} = 4.71, SD = 1.48, F(1, 213) = 3.07, p = .08$) and A_b ($M_{time} = 5.25, SD = 1.28$ vs. $M_{no_time} = 4.97, SD = 1.48, F(1, 213) = 2.23, p > .05$) were not significant (see Table 8). The results supported H2a, H2b, and H2c, but not H2d and H2e.

	Perceived	Ad			
	Control	Intrusiveness	Ad Irritation	Aad	Ab
Time Display	4.25 (1.87)	4.20 (1.16)	3.19 (1.56)	5.05 (1.44)	5.25 (1.28)
No Time Display	3.82 (1.93)	4.54 (1.22)	3.66 (1.65)	4.71 (1.48)	4.97 (1.48)
F Value	5.52*	4.86^{*}	5.04*	3.07	2.23

Table 8. The Main Effect of Time Display (Mean)

Note. Values in parentheses indicate standardized deviation. Statistically significant at *<.05

Interaction between Skip Option and Time Display. H3 predicted that the effect of the time display on ad evaluation would be moderated by the presence of a skip option. The result of a 2 (Skip option: presence vs. absence) \times 2 (Time display: presence vs. absence) MANOVA was not significant (Wilks' Lamda = .97, F = 1.26, p > .05; perceived control (F(1, 213) = .66, p >.05), ad intrusiveness (F(1, 213) = 1.55, p > .05), ad irritation (F(1, 213) = 1.12, p > .05), A_{ad} (F(1, 213) = 2.88, p > .05), and A_b (F (1, 213) = .22, p > .05). To examine the interaction effect further, subsequent contrast tests were run for each skip option group. The results revealed a non-significant effect of the time display on perceived control (F(1, 107) = 1.32, p > .05), ad intrusiveness (F(1, 107) = .50, p > .05), ad irritation (F(1, 107) = .84, p > .05), A_{ad} (F(1,.01, p > .05), and A_b (F (1,107) = .58, p > .05) in the skippable ad condition. Meanwhile, when the ad skip option was absent, significant effects of time display emerged at a p level of .05 on perceived control (F(1, 106) = 4.52, p < .05), ad intrusiveness (F(1, 106) = 5.48, p < .05), ad irritation (F(1, 106) = 4.70, p < .05), and A_{ad} (F(1, 106) = 5.48, p < .05), but not on A_b (F(1,106) = 1.77, p > .05). However, because the five separate contrast tests increased the number of Type I errors, the Bonferroni correction procedure was used (Bland and Altman 1995). Consequently, an adjusted alpha level of .01 (overall α /number of test = .05/5 = .01) was used to reexamine the hypotheses for the non-skippable ad condition. The effects of the time display

were non-significant at a *p* level of .01 but significant at a *p* level of .05 on perceived control (*F* (1, 106) = 4.52, *p* = .04), ad intrusiveness (*F* (1, 106) = 5.48, *p* = .02), ad irritation (*F* (1, 106) = 4.70, *p* = .03), and A_{ad} (*F* (1, 106) = 5.48, *p* = .02). Thus, H3a, H3b, H3c, H3d, and H3e were not supported (see Table 9 and Figure 3).

	C	Skippable		No	Non-skippable			
	Time display	No Time display	F	Time display	No Time display	F		
Perceived Control	5.39 (1.25)	5.08 (1.52)	1.32	3.14 (1.70)	2.51 (1.36)	4.52		
Ad Intrusiveness	4.01 (1.16)	4.16 (1.05)	.50	4.40 (1.14)	4.94 (1.25)	5.48		
Ad Irritation	2.98 (1.28)	3.24 (1.60)	.84	3.39 (1.78)	4.10 (1.60)	4.70		
Aad	5.03 (1.29)	5.02 (1.49)	.01	5.06 (1.59)	4.38 (1.42)	5.48		
Ab	5.27 (1.20)	5.08 (1.45)	.58	5.23 (1.37)	4.86 (1.52)	1.77		

Table 9. Planned Contrast Test

Note. All results were not significant when using Bonferroni-adjusted alpha level of .01.



Figure 3. Interactions between Skip Option and Time Display

To answer RQ2, the study investigated whether ad exposure time mediated the interaction effect of an ad skip option and an ad time display on ad intrusiveness and ad irritation using the PROCESS macro (Hayes, 2012). A significant direct interaction effect on ad intrusiveness emerged (b = -1.24, p < .01); however, the indirect interaction effect on ad intrusiveness via ad exposure time was not significant (b = .02, p > .05). Moreover, a significant direct interaction effect on ad irritation emerged (b = -.38, p < .01); however, the indirect interaction effect on ad irritation emerged (b = -.38, p < .01); however, the indirect interaction effect on ad irritation emerged (b = -.38, p < .01); however, the indirect interaction effect on ad irritation via ad exposure time was not significant (b = .05, p > .05). The results show that ad exposure time did not mediate the interaction effect of an ad skip option on reactance.

Hypotheses Testing: H4 through H10

The mediating roles of perceived control, ad intrusiveness, and ad irritation, and the moderating role of desire for control were tested using a Structural Equation Modeling (SEM). The following three stages were employed. First, the measurement model was investigated to check the reliability and the validity of the constructs. Second, following the Two-Step approach suggested by Anderson and Gerbing (1988), comparisons of alternative models were employed to find a theoretically plausible and parsimonious model. Third, the bootstrapping analyses were conducted for hypotheses testing.

Measurement Model. Before examining the overall fit of the proposed model and the mediation effect, the measurement model including all five constructs was investigated. The fit indices of the initial CFA showed acceptable model fit ($\chi^2 = 519.68$, df = 161, χ^2/df ratio = 3.23, NFI [normed fit index] = .90, CFI [comparative fit index] = .90, TLI [Tucker-Lewis index] = .88, RMSEA [root mean square error of approximation] = .10). In order to improve model fit, the factor loadings of each item to the latent variables were considered. All items had factor loadings

higher than |.45| to each intended latent variable. The modification indices (MI) were also considered. As a result, the error covariance of one pairs within the Ad Intrusiveness construct (i.e., interfering-intrusive; MI = 39.35), and another pair within the Ad Irritation construct (i.e., irritation-phony; MI = 40. 19) were correlated due to high MI. These modification procedures significantly improved model fit (χ^2 = 394.94, df = 141, χ^2/df ratio = 2.80, IFI = .93, CFI = .93, TLI = .91, RMSEA = .07).

Discriminant and convergent validity of the latent variables were examined using the criteria recommended by Fornell and Larcker (1981) (i.e., Average Variance Extracted (AVE) > .50, AVE > Maximum Shared Variance (MSV), and AVE > Average Shared Variance (ASV)). The results indicate that the constructs used in the model were both reliable and valid (Perceived Control: AVE = .58, MSV = .07, ASV = .04; Ad intrusiveness: AVE = .57, MSV = .31, ASV = .17; Ad Irritation: AVE = .73, MSV = .31, ASV = .13; A_{ad}: AVE = .85, MSV = .74, ASV = .25; A_b: AVE = .85, MSV = .74, ASV = .23).

Model Estimation and Comparison. As an initial step in testing the hypotheses, the twostep modeling approach was employed a) to determine the best model and b) to examine the overall relationship structure of the proposed model. As a first step of the model validation process, the null model (i.e., Mn) was compared to the saturated model (i.e., Ms; measurement model) to assess if any structural model that would have a satisfactory goodness of fit existed. χ^2 of Mn was 3763.37 (*df*=171), while χ^2 of Ms was 394.94 (*df*=141). Since the χ^2 difference is much greater than critical χ^2 value with 30 degree of freedom difference at a *p* value of .05, the result suggests that the proposed measurement model is theoretically meaningful enough to continue with the two-step approach for model estimation. In this second step of model comparison, five alternative models (Mt [proposed model], Mc1, Mc2, Mc3, and Mc4) were compared to determine the most theoretically plausible and parsimonious model. The simple diagrams for these five competing models are depicted in Table 10. Following the non-significant interaction effect of Skip Option × Time Display on Perceived Control found from 2×2 MANOVA (See H3 testing) earlier in this study, the interaction effect on Perceived Control was excluded from the four constrained models. Mc1 only excludes the interaction effect of Skip Option × Time Display on Perceived Control. Mc2 also de-emphasizes the role of perceived control on ad irritation, while Mc3 de-emphasizes the effect of ad intrusiveness on A_{ad}. Finally, based on the literature, which demonstrated ad irritation as a full mediator between ad intrusiveness and attitudinal reaction (McCoy et al. 2008), Mc4 de-emphasizes both the role of perceived control on ad irritation and the role of ad intrusiveness on A_{ad}.

First, to compare Mt and Mc1, which are non-nested, AIC (517.4 for Mt and 485.26 for Mc1) and BIC (703.29 for Mt and 657.64 for Mc1) were compared, and both criteria indicate that Mc1 is superior model. Then, Mc1 was compared with two different nested models, Mc2 and Mc3. Since they are nested models, the difference between χ^2 statistics values were obtained for each nested structural model. Since the chi-square difference tests indicated that there is no significant difference between Mc1 and Mc2 ($\Delta \chi^2 = .05$, $\Delta df = 1$, p > .05) and Mc1 and Mc3 ($\Delta \chi^2 = 1.78$, $\Delta df = 1$, p > .05), based on Anderson and Gerbing's decision-tree framework, more parsimony models, Mc2 and Mc3 were accepted and compared with the most constrained model, Mc4. Finally, the comparison between Mc2 and Mc4 ($\Delta \chi^2 = 1.78$, $\Delta df = 1$, p > .05) and Mc3 and Mc4 ($\Delta \chi^2 = .05$, $\Delta df = 1$, p > .05) indicated that the Mc4 is the best model because it is more parsimonious than Mc2 and Mc3, while the model fit (as supported by χ^2) is consistent across the

models. Although other fit indices (e.g., CFI, TLI, RMSEA) represent almost identical results across five competing models, the χ^2 statistics and the model parsimony suggest that our final model, Mc4, better explains the mechanism in which ad control features (i.e., skip option and time display) form consumers' attitude toward the ad and brand. The goodness-of-fit indices for competing models are presented in table 10.

Model	Diagrams of tested model	x2(df)	CFI	NFI	TLI	RMSEA
Mt		2.06 (198)	.95	.94	.91	.07
Mc1		2.13 (180)	.95	.94	.90	.07
Mc2		2.12 (181)	.95	.94	.90	.07
Mc3		2.13 (181)	.95	.94	.90	.07
Mc4		2.13 (182)	.95	.94	.90	.07

Table 10. Competing Models and Goodness-of-Fit Indices

Then, the overall relationship structure of the selected model (Mc4) was examined. The final model with path coefficients is depicted in Figure 4.

Note. CFI=comparative fit index; NFI=normed fit index; TLI=Tucker-Lewis index; RMSEA [root mean square error of approximation; Mt=theoretical model; Mc=constrained model.



Note. Statistically significant at **p*<.05, ***p*<.01, or ****p*<.001

Figure 4. Final Model (Mc4)

Bootstrapping Analysis: The Mediating Role of Perceived Control. To test the mediating role of perceived control between ad skip option and viewers' cognitive reactance to the ad (i.e., ad intrusiveness), a bootstrapping analysis was performed (Cheung and Lau 2008). The significance of indirect effects was tested by examining the bias-corrected (BC) 95% confidence intervals (CI). The results of bootstrapping analysis indicate a significant indirect effect of ad skip option on ad intrusiveness (Indirect effect: SE = -.26; BC 95% CI = -.39 to -.15; p < .01). However, there was no significant direct effect from ad skip option to ad intrusiveness (Direct effect: SE = -.04, p > .05), indicating that perceived control fully mediated the effect of ad skip option on ad intrusiveness. Thus, H4a was supported. A bootstrapping analysis indicated that perceived control also fully mediate the effect of time display on ad intrusiveness (Indirect effect: SE = -.06; BC 95% CI = -.12 to -.01; p < .01; Direct effect: SE = -.11, p > .05). Thus, H5a was supported. These results confirm the mediating role of perceived control between ad control features (i.e., ad skip option and time display) and viewers' cognitive reactance to the ad.

Furthermore, the mediating effect of perceived control in the relationship between the ad control features (i.e., ad skip option and time display) and affective reactance to the ad (i.e., ad irritation) was examined. The results of a bootstrapping analysis indicate that no significant direct effect of the skip option on ad irritation existed (Direct effect: SE = -.04, p > .05), but the skip option indirectly affected irritation via perceived control and ad intrusiveness sequentially (Ad skip option \rightarrow Perceived Control \rightarrow Ad Intrusiveness \rightarrow Ad Irritation; Indirect effect of skip option on ad intrusiveness: SE = -.14; BC 95% CI = -.24 to -.08; p < .01). Thus, H4b was supported. Similarly, the mediating role of perceived control between time display and ad irritation occurred only via ad intrusiveness, indicating sequential mediation effects (Lleras 2005) (Time Display \rightarrow Perceived Control \rightarrow Ad Intrusiveness: SE = -.03; BC 95% CI = -.08 to -.01; p < .01). However, no significant direct effect of time display on ad irritation emerged (Direct effect: SE = -.06, p > .05). Thus, H5b was supported.

Bootstrapping Analysis: The Mediating Role of Ad Reactance. To test the mediating role of cognitive and affective ad reactance between perceived control and A_{ad} , a bootstrapping analysis was performed. The significance of indirect effects was tested by examining the BC 95% CI. Results of the bootstrapping analysis indicate that the indirect effect of perceived control on A_{ad} occurred via sequential mediators, Ad Intrusiveness and ad irritation (Perceived Control \rightarrow Ad Intrusiveness \rightarrow Ad Irritation $\rightarrow A_{ad}$; Indirect effect of perceived control on A_{ad} : SE = .07; BC 95% CI = .03 to .12; p < .01), while no significant direct effect of perceived control on A_{ad} emerged (SE = .03, p > .05). These results suggest the mediating role of cognitive and affective ad reactance between perceived control and A_{ad} . Thus, H6, H7, and H8 were supported.

Dath	Madiatar	Significance of effect		
Path	Mediator	Indirect	Direct	
		(SE)	(SE)	
Skip Option \rightarrow Intrusiveness Perceived Control		26**	04	
Time Display \rightarrow Intrusiveness	Perceived Control	06**	11	
Skip Option \rightarrow Irritation	Perceived Control, Intrusiveness (SQ ¹)	14**	04	
Time Display \rightarrow Irritation Perceived Control, Intrusiveness (SQ)		03**	06	
Perceived Control \rightarrow Aad	Intrusiveness, Irritation (SQ)	.07**	.03	

Table 11. Results of Mediation Tests

Note. ¹SQ = Sequential Mediators Statistically significant at **<.01

Multi-Group Moderation Analysis: The Moderating Role of Desire for Control (DFC).

To test the moderating role of DFC, a multi-group moderation test (high DFC vs. low DFC) was conducted. To investigate whether DFC moderated the effect of perceived control on ad intrusiveness (H9), the path coefficients across the two groups were examined using the critical ratios for differences test. The critical ratio for differences test investigates whether significant differences exist between a pair of parameter estimates in terms of magnitude. When the critical ratio surpasses 1.96 in magnitude (i.e., |1.96|), the effect of a particular path is significantly stronger in one group than the other groups at a *p* level of .05, indicating a moderating role (Byrne 2009). Following this criterion, for the high DFC vs. low DFC groups, the path coefficients of Perceived Control \rightarrow Ad Intrusiveness (critical ratio difference = -1.78) were not significantly different at a *p* level of .05. Results indicate that the effects of perceived control on ad intrusiveness was not significantly different depending on the level of DFC. Thus, H9 was rejected.

Н	Independent Variables	Dependent Variables	Types of Analysis	Results
H1a (Supported)	Skip Option (Presence vs. Absence)	Perceived Control	MANOVA	Presence > Absence
H1b (Supported)	Skip Option (Presence vs. Absence)	Ad Intrusiveness	MANOVA	Presence < Absence
H1c (Supported)	Skip Option (Presence vs. Absence)	Ad Irritation	MANOVA	Presence < Absence
1d (Not Supported)	Skip Option (Presence vs. Absence)	Aad	MANOVA	Presence = Absence
le (Not Supported)	Skip Option (Presence vs. Absence)	Ab	MANOVA	Presence = Absence
H2a (Supported)	Time Display (Presence vs. Absence)	Perceived Control	MANOVA	Presence > Absence
H2b (Supported)	Time Display (Presence vs. Absence)	Ad Intrusiveness	MANOVA	Presence < Absence
H2c (Supported)	Time Display (Presence vs. Absence)	Ad Irritation	MANOVA	Presence < Absence
2d (Not Supported)	Time Display (Presence vs. Absence)	Aad	MANOVA	Presence = Absence
2e (Not Supported)	Time Display (Presence vs. Absence)	Ab	MANOVA	Presence = Absence
H3a (Supported)	Skip Option x Time Display	Perceived Control	MANOVA	Time (Presence > Absence) in Skip Absence
H3b (Supported)	Skip Option x Time Display	Ad Intrusiveness	MANOVA	Time (Presence < Absence) in Skip Absence
H3c (Supported)	Skip Option x Time Display	Ad Irritation	MANOVA	Time (Presence < Absence) in Skip Absence
H3d (Supported)	Skip Option x Time Display	Aad	MANOVA	Time (Presence > Absence) in Skip Absence
3e (Not Supported)	Skip Option x Time Display	Ab	MANOVA	Presence = Absence
	Path	Mediator	Types of Analysis	Results
H4a (Supported)	Skip Option> Ad Intrusiveness	Prceived Control	SEM (Bootstrapping Analysis)	SO> PC> AIN
H4b (Supported)	Skip Option> Ad Irritation	Prceived Control	SEM (Bootstrapping Analysis)	SO> PC> AIN> AIR
H5a (Supported)	Time Display> Ad Intrusiveness	Prceived Control	SEM (Bootstrapping Analysis)	TD> PC> AIN
H5b (Supported)	Time Display> Ad Irritation	Prceived Control	SEM (Bootstrapping Analysis)	TD> PC> AIN> AIR
H6 (Supported)	Perceived Control> Aad	Ad Intrusiveness	SEM (Bootstrapping Analysis)	PC> AIN> AIR> Aad
H7 (Supported)	Perceived Control> Aad	Ad Irritation	SEM (Bootstrapping Analysis)	PC> AIN> AIR> Aad
	Antecedents	Consequences	Types of Analysis	Results
H8 (Supported)	Ad Intrusiveness	Ad Irritation	SEM (Path Analysis)	Ad Intrusiveness> Ad Irritation
	Independent Variable	Dependent Variable	Types of Analysis	Results
9a (Not Supported)	Perceived Control x DFC	Ad Intrusiveness	SEM (Multi-Group Moderation Analysis)	DFC (High = Low)
Ob (Not Supported)	Deroeived Control v DEC	A.d. Lenitotion	SEM (Multi-Group Moderation Analysis)	DFC(Hioh = I, ow)

of Results
Summary
12.
Table

CHAPTER 6

DISCUSSION

Summary

The current study investigated the impacts of two online video ad control features (i.e., skip option and time display) on perceived control over the ad, psychological reactance to the ad, and subsequent advertising outcomes. The results of the online experiment show that viewers perceived a higher level of control over the ad when the skip option was available than when the skip option was not available. With regard to psychological reactance, skip option availability reduced both cognitive and affective reactance, resulting in lower ad intrusiveness and lower ad irritation. However, the presence of the skip option did not result in more favorable A_{ad} or A_b . Meanwhile, the effect of the time display increased the perception of control over the ad, ad intrusiveness, and ad irritation. However, the presence of the time display, in general, were greater when the skip option was unavailable than when it was available. Perceived control mediated the effects of the skip option and the time display on ad intrusiveness, and ad irritation mediated the effect of the perceived control on A_{ad} and A_b . Lastly, individual's DFC did not significantly moderated the influence of perceived control on ad intrusiveness.

Theoretical Implications

The findings of the current study contribute to psychological reactance theory by indicating how digital control features reduced psychological reactance to forced exposure to online video ads. The current study confirmed that the ability to skip an ad (behavioral control),

and the ability to assess the length of an ad (cognitive control) minimized the negative consequences of forced exposure to a mid-roll video ad. The results support the findings of McCoy et al. (2008), which found that user control over the removal of pop-up ads that obscured site content lowered ad intrusiveness and ad irritation, making attitude toward the website more favorable. Extending previous findings, the current study shows the possibility that lower ad intrusiveness might also influence A_{ad}. When an individual is forcibly exposed to an online video ad, he or she might blame the website for the interruption. However, having to wait through a mid-roll ad, the individual might also develop a negative attitude toward the advertisement as well. Moreover, a series of mediation analyses suggests that favorable Aad and Ab were not directly influenced by the two ad control features, but indirectly influenced through decreased ad intrusiveness and decreased ad irritation. In addition, the insignificant mediation effects of ad exposure time suggest that the skip option reduced reactance to forced ad exposure due to an increase in perceived control rather than an actual difference in ad exposure time. Even though the availability of an ad skip option actually resulted in shorter ad exposure time, ad exposure time did not significantly predict reactance. Indeed, longer ads do not always lead to higher reactance because they might actually engage viewers.

The presence of a time display also positively influenced perceived control, ad intrusiveness, and ad irritation. As predicted, being able to see the duration of the ad increased perceived control over the ad, reducing reactance to the forced exposure. This result also emphasizes the role of cognitive control in reducing the stress of anticipating the arrival of aversive stimuli (Averill 1973). The potential advantage of a time display (vs. a skip option) is that it increases the perception of being in control while watching the ad but does not shorten duration of ad exposure. In other words, it could increase perception of control and gives viewers

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more time to elaborate on the ad message. Even though it was statistically not significant, the presence of the time display marginally led to favorable A_{ad} . Moreover, the effects of the time display on the dependent variables were greater when the skip option was not available than when it is available. This finding implies that the role of cognitive control over negative stimuli becomes stronger when behavioral control is limited because the receiver can estimate the consequences of an event and minimize the potential stress associated with stimuli.

The current study also shows the importance of distinguishing actual control features from perceived control because a higher number of the former does not always lead to a higher level of the latter. Actually, the current study shows that the effect of the skip option on perceived control was greater than the effect of the time display and that the effect of the time display was not significant when the skip option was available. To examine the effect of control accurately, therefore, perceived control should be used rather than the number or type of actual control features. The structural model revealed in the current study shows that perceived control reduced reactance to forced exposure to the ad. This relationship supports the assumption of psychological reactance theory, which claims that reactance is based on loss of control over one's environment (Brehm and Brehm 1981). The study further confirmed the negative relationship between the ad reactance variables and ad outcomes (Edwards 2002). The current study could not observe the significant difference between individuals with high DFC and those with low DFC at a *p* level of .05. However, since the above difference was significant at a *p* level of .10, the role of DFC still deserves more attention from researchers.

Practical Implications

The current study has several implications for advertising practitioners. First of all, the findings suggest that a skip option could be an effective tool to minimize negative responses to

in-stream video ads. The primary reason that YouTube introduced a skippable ad format was to enhance user satisfaction with the site (e.g., longer staying time and higher intention to return). Indeed, Pashkevish et al. (2012) demonstrated that skip option availability improved user experience with the site via multiple dimensions (e.g., longer time spent watching videos on YouTube, higher user-reported satisfaction scores, and more frequent search queries on the site). In addition to previous findings, the current study suggests that a skip option might also benefit advertisers. Advertisers could avoid detrimental backlash from forcing viewers to wait for instream video ads to end, especially viewers who are engaged in watching videos that demand a high level of cognitive effort (e.g., short instructional videos). However, advertisers should use the skip option carefully because while it increases perceived control, it also increases actual skipping behavior, limiting delivery of the ad message. In this regard, advertisers should also consider effective ways to deliver an ad message before viewers decide to skip the ad.

Second, this study highlights the value of perceived cognitive control over a video ad. In particular, the findings encourage the use of a time display to alleviate negative ad responses. Although the impact of the time display was relatively smaller than the skip option, the former enables advertisers to deliver a full ad message to viewers while still giving viewers the perception of being in control. Advertisers should also consider other ad strategies that might enhance cognitive control. For instance, giving information about an ad prior to exposure is likely to enhance perceived control over the ad and minimize reactance to forced exposure. Because the effects of a time display tend to vanish when a skip option is available, advertisers should be aware that using both control features will not likely double the effect size. In other words, merely increasing the number of control features will not necessarily lead to higher perceived control, so advertisers should also consider the interaction effects between control

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features. The presence of control features in online video ad displays will likely gain favor from audiences with high DFC because the impact of perceived control on ad intrusiveness was greater for them in the current study. If Internet users with high DFC were identified using demographics or behavioral data, advertisers could maximize the effect of control features by personalizing the level of control. Despite these practical implications, advertisers should remember that the findings of the current study are unique to the online media environment. The findings might not apply to commercial breaks in traditional media because their audiences tend to have lower levels of control and tend to process information more passively.

Limitations and Future Research

Several limitations of the current study open pathways to future research. First of all, the current study conducted an online experiment in which subjects chose the video content they wanted to watch and were exposed to in-stream video ads while learning a skill from the primary video. Even though exposure to instructional content is a typical reason to stream videos, some Internet users watch videos for other reasons (e.g., emotional fulfillment). In addition, the study offered five options for video content in an attempt to make participants feel they had control over the content. However, the use of pre-defined tasks might limit the generalizability of the results. In reality, Internet users have virtually unlimited options in choosing the videos they watch (i.e., greater control over content). If the current study reflected this enormous user control over content, the effect of perceived control might be larger than the findings indicate. The current study focused on the role of ad control features; therefore, the contextual congruency between the ad and the primary video content was deliberately limited to simulate a threat to user freedom that might be partially attenuated. Because ad context congruency has been known to reduce reactance, the results might have been different if the ad and the content have been

relevant to each other. Future studies could examine how ad control features and contextual congruency interact. For similar reasons, the study used mid-roll ads because they more substantially interrupt the flow of a media experience than pre-roll or post-roll ads do. The effects might differ if the in-stream ads appeared at different times. Actually, Henger et al. (2016) found that the skip option had no effect on reducing perceived intrusiveness of pre-roll ads. Therefore, future studies should systematically examine how the effect of control over video ads varies with ad insertion timing. Another limitation might stem from the measurement of perceived control. The current study employed a two-item scale adapted from the user control measure in Song and Zinkhan (2008) (i.e., a sub-dimension of website interactivity). However, the concept of perceived control over an ad could have multiple dimensions. Developing a measurement to assess the concept of perceive control over online video advertising more precisely would greatly contribute to the advertising literature.

Conclusion

As the amount of online ad clutter has continued to increase, the demand for user control over advertising has also increased. Digital media platforms are capable of increasing user control over ads in various ways. The current study investigated the effects of an ad skip option and a time display on viewers' perceived control over and subsequent responses to online video ads. The findings suggest that the two control features increased perceived control, lowering the chance of negative ad responses. Examining viewer control over digital advertising can shed light on the various ways in which humans interact with online video ads and provide valuable insights to online marketers.

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